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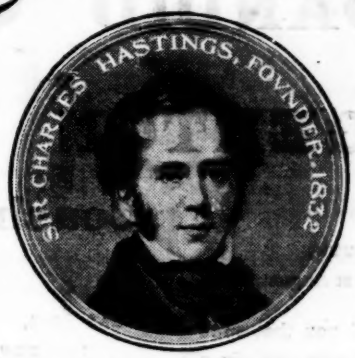

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

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WITH SUPPLEMENT.

No. 3285. SATURDAY, DECEMBER 15, 1923. Price 1/3

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The Vicary Lecture

ON THE

LIFE AND TIMES OF WILLIAM CLIFT,

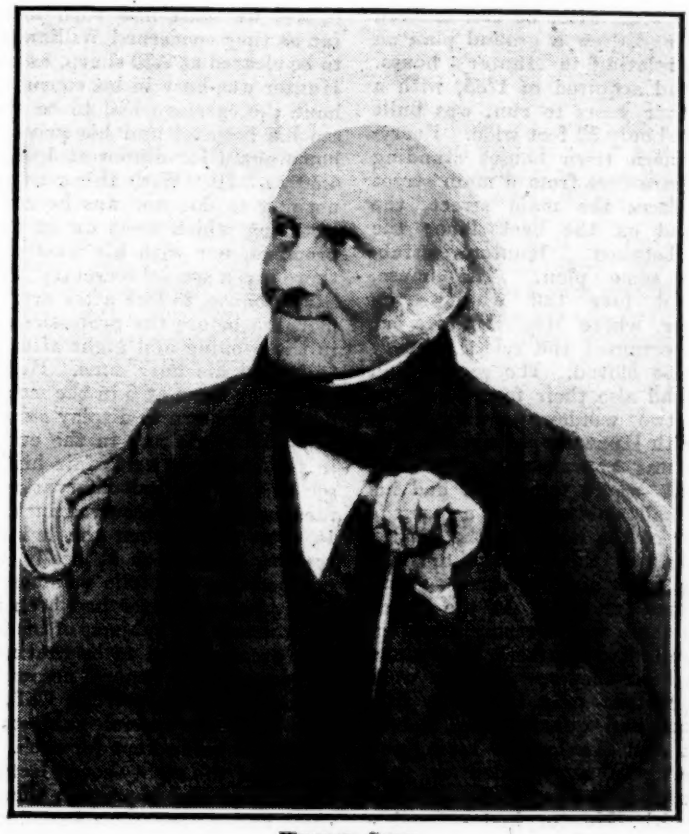
FIRST CONSERVATOR OF THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

GIVEN IN THE THEATRE OF THE ROYAL COLLEGE OF SURGEONS, FRIDAY, DECEMBER 7TH, 1923,

BY

SIR ARTHUR KEITH, M.D., F.R.S.,
CONSERVATOR OF THE MUSEUM.

On the 14th of February, 1792, the household of John Hunter, on the east side of Leicester Square, was the scene of two events. In the first place, its master's birthday was being celebrated; sixty-four years before he had been born on the farm of Long Calderwood, situated within sight of the smoke of Glasgow. In the second place, a country lad, William Clift, had arrived from Bodmin, in Cornwall. Probably no one in the household knew, or cared to know, that the day of his arrival was also William Clift's birthday; he was born at Bodmin on February 14th, 1775, and thus on the day of his arrival in Hunter's house had just completed his seventeenth year. He was a poor lad; all he possessed in the world were the clothes he stood up in, with "four changes of shirts and neckcloths," unless we add certain indentures which he is said to have carried in his pocket, wherein Hunter had undertaken to teach him, "in his best manner," to draw, write, and dissect. It is difficult to believe that Hunter could have made a promise about writing and drawing, for he could not draw and his writing was indifferent, whereas Clift was already a skilful draughtsman and an exquisite penman.*



WILLIAM CLIFT.
First Conservator of the Museum of the Royal College of Surgeons of England.
Appointed 1800; retired 1842. Died 1849.
(From a Lithograph in the Conservator's Room at the College.)

Thus in this household in Leicester Square we have brought together, from Scotland and from Cornwall, two men of diverse ages whose lives were destined to be linked together in an altogether peculiar manner. The bond between them was soon to be broken; Clift had only served his master for twenty months when the catastrophe at St. George's Hospital left him stranded in Hunter's derelict Museum. For fifty years Clift remained the honest steward of the great collection which Hunter left behind, and the undaunted upholder of his name and fame.

There was more than a mere coincidence of birthdays to link these two men together. As Clift aged, those who had known Hunter saw in him a remarkable physical likeness to his master. Both were small, active men; Hunter's height was only 5 ft. 2 in. To those who insinuated that this likeness was due to more than a coincidence Clift would reply: "If I thought what you insinuate were true there is not a Duke in London I would touch my hat to."

*A list of the documents and publications from which the facts given here have been drawn is added at the end of this lecture.

Clift's Parentage and Upbringing.

Before following young Clift to the place he was to occupy in Hunter's household we must turn aside for a moment to trace his early life in Bodmin. His birthplace—a flour mill—was swept away when the London and South-Western Railway built its station in the valley about one mile to the west of the centre of the town. But the little stream which turned the wheel of Burcombe Mill is still running; there are still men and women who remember the old dilapidated millhouse.† In 1775, when his youngest son, William, was born, the affairs of the miller, Robert Clift, were hastening from bad to worse; he had to leave the mill, and three years later died in Bodmin at the age of 58, leaving his wife, Joanna Courts, and his family, in poverty. The widow and daughters earned a scanty and precarious livelihood by carding and spinning wool in the winter and by working in the fields in other seasons—each member earning from fourpence to sixpence a day. "My mother," says Clift, "starved herself to save threepence a week for my schooling." Then in 1783, when Clift was eight years of age, his mother died, and thus, to use his own words, "I was cast adrift on the wide wide world." He did not drift very far; he entered the service of Mr. George King, a nurseryman at Bodmin, at fourpence a day. Mr. King was given to brandy and water, or as Clift expressed it, "to brandy without water," and in his cups, and after them, was passionate and dangerous. In one of these fits, some two or three years after Clift entered his service, he chased, while mounted on horseback, his nimble-footed apprentice from the nursery. The young apprentice made his foreman and fellow workmen merry by producing a graphic caricature of the incident, but when shown to Mr. George King it made him so angry that young Clift again found himself "adrift in the wide wide world." He thought of enlisting, but as he put it, "neither Mr. George King or King George" would have anything to do with him. He thereupon obtained further employment in Bodmin with one who carried on an extensive business as farmer and corn merchant. Here he found himself, so he declared, in the congenial company of horses; and here, too, but for an incident to be mentioned presently, he would likely have remained, for as we shall see he had ingrained within him that spirit of timidity and tendency to self-criticism which makes men seek for service rather than for command. Men of his nature are often the hardest judges of their fellow men, and to this Clift was no exception.

Near by Bodmin Church is the Priory; from its grounds issues the stream which flows by Burcombe Mill. In Clift's youth the Priory was occupied by Major Gilbert, and his wife, Mrs. Gilbert, had been at school with Anne Home,

† I gladly avail myself of this opportunity of acknowledging my indebtedness to Miss M. S. Collins of St. Gurons, Bodmin, who has supplied me with many details relating to Burcombe Mill and Clift's early history; Miss Collins, through my friend Mr. Walter Rogers of Falmouth, has presented a water-colour sketch of Burcombe Mill to the Hunterian album kept by the Librarian of the Royal College of Surgeons. To Mr. Victor Plarr, the Librarian, I am deeply indebted; he has placed the manuscripts in his keeping most freely at my disposal. In the College there are preserved a lithograph and a wash drawing of Clift and also a plaster bust, done in 1842.

John Hunter's wife. Mrs. Hunter spoke of Mrs. Gilbert as "her oldest and dearest friend." They knew at the Priory that Hunter had lost the services of William Bell—his draughtsman, amanuensis, and assistant in the Museum. In 1789 Bell, who had been in Hunter's service for fourteen years, had accepted a surgeoncy in Sumatra, and although three years had come and gone since his departure Hunter could find no one fit to become his successor. It was upon Mrs. Gilbert's recommendation that this Cornish lad, earning some tenpence a day, had his course of life suddenly diverted; from a poverty-stricken home in Cornwall he was suddenly transported to one of the most remarkable households which London has ever seen—to become the worthy successor of William Bell.

Hunter's House and Museum.

The household in which young Clift now found himself an inmate stretched from Leicester Square eastwards to Castle Street—now converted into Charing Cross Road. Our intimate knowledge of the shape and size of the establishment we owe to Clift; forty years after he first entered it he sat down late one night and drew a ground plan on which are entered all details relating to Hunter's house. The property which Hunter had acquired in 1783, with a lease which had only twenty-four years to run, was built on a long narrow strip of ground only 30 feet wide. Everyone is familiar with our modern town houses standing upon a strip of ground which stretches from a main street to a back lane; the house faces the main street, the stables, and coach-house stand on the back lane; the garden occupies the space between. Hunter's establishment was built on the same plan. The house, facing Leicester Square, had four tall windows on its drawing room or first floor, where Mrs. Hunter, her flaxen hair turning grey, entertained the select literary and artistic circle in which she moved. The second and third floors—bedroom floors—had also their four windows; the ground floor had only two windows—dining room windows—for the front door with Hunter's plate was to the visitor's right as the house was approached. The door opened into a commodious hall—where the butler had his chair. Passing through the hall one entered a passage leading along the ground floor of the house to the garden or yard; to the right and left of this passage or back hall were Hunter's consulting room and his study—rooms with which Clift was to become familiar. At the Castle Street end in place of stables there was a roomy dwelling, where Hunter's five house-pupils had quarters, and where Elizabeth Adams presided as housekeeper. As time went on she came to take an important part in Clift's life. Here was the dissecting room and quarters for Robert Haynes, who looked after it and the lecture room, and here, too, was Clift's abode. In the garden or yard stretching from the one house to the other, about 110 feet in length and 30 feet in width, Hunter had erected a building with an inside measurement 51 feet long and 28 feet wide. The ground floor was divided so as to serve as a reception room towards the Leicester Square end and a lecture room towards the Castle Street end. The lofty upper floor of this building served as a Museum; round it ran a gallery on the shelves of which stood Hunter's wonderful collection of physiological preparations—the part of the Museum which became Clift's special pride. From the gallery a fossil or cabinet room opened off.

The Museum did not occupy the whole length of the garden or yard; between it and the house on Leicester Square (No. 28) there was room for the building in which Hunter kept his collection of drawings and prints and where his artist worked. The space between the Castle Street house (No. 13) and the eastern end of the Museum was enclosed by a glazed roof, covering the sunken basement or souterrain where Hunter kept his six horses, his coaches, and the skull of a large whale-bone whale. To reach the Castle Street level the coachman had to drive up an inclined way.

Life in Hunter's Household.

Clift found himself a member of a very large establishment. If we include Earl's Court, which was really an experimental station run in connexion with Leicester Square, there were fifty people depending on Hunter for their sustenance or pay. Down in the basement kitchen floor there was the butler, the housekeeper (Mrs. Martin), the Welsh cook (Mary Edwards), Mrs. Hunter's maid, two housemaids, and the needlewoman. William Clift apparently became acquainted with the kitchen; at least he wrote of this period: "I knew there was plenty of eating but no pocketing; Mrs. Martin (the housekeeper) looked too sharp after all but her own friends." Then down in the stables there was Mrs. Hunter's coachman and her footman as well as Mr. Hunter's coachman and footman. In the drawing room there was the tall and elegant Mrs. Hunter; for her and for Miss Hunter (afterwards Lady Campbell) Clift acquired and retained an unbounded respect and devotion. Miss Hunter had her visiting elecution master. Then, in vacation times, there was also young John, down from learning expensive habits in St. John's College, Cambridge. Workmen and tradesmen kept coming and going all day long.

We have touched on the social side of John Hunter's house; we must now turn to its professional activities so far as they concerned William Clift. The dining room had to be cleared at 9.30 sharp, as patients began to arrive then. Hunter was busy in his consulting room until 12.30; at this hour the carriage had to be at the door and he set out to see his hospital and his private patients, hoping to reach home again for dinner at 4, and have time for a nap from 4.30 to 5.30. With this part of the day's work Clift had nothing to do; nor was he concerned in the teaching and lecturing which went on in the Castle Street end of the premises, nor with his master's duties as surgeon-general; there was a special secretary, with his quarters in the Castle Street house, to look after army affairs. It was early in the morning before the professional round commenced and late in the evening and night after it was finished that William Clift had his busy time. He had to meet Hunter in the dissecting room at 6 in the morning—to fetch, carry, inject, draw, and learn to display structures with a scalpel. Then, when Hunter's nap in the evening was over, he had to be in the study to write fair his master's rough notes of dissections, of clinical observations, and of new thoughts and ideas which had occurred in the course of the day's round. It must have taken the lad some months to fathom the system, orderly as it really was, in which his master's manuscripts and folio volumes were arranged. During the thirty years Hunter had been researching and building up his Museum the subjects of his inquiry were ever broadening, new accounts had to be continually opened in his scientific ledgers and old general accounts distributed under a series of new headings. When Clift joined him he found about one hundred special subjects being pursued, a special fasciculus being kept for each. Then there were the manuscripts of the eighty-seven lectures on surgery, always being augmented and improved; there were records of his clinical cases and *post-mortem* examinations; but beyond all these in value were the ten folio volumes, each devoted to a particular section of the Kingdom of Life, in which were inscribed in its appropriate place the dissections, measurements, and drawings made by Hunter in the early morning hours. Three of these volumes lay on the table when Reynolds painted the master's portrait. One had been opened to show us the illustrations of a page in the folio devoted to man and apes—from which we may infer that Hunter was a pre-Darwinian evolutionist. On the table below this folio lies a sheet of drawings which tell us that Hunter had invented a method of measuring the facial angle of man and beast. His Museum was but a concrete illustration of the contents of his manuscripts. This harvest of the lifetime of a man of genius—all save a few fragments and the manuscripts which Clift had copied and thus preserved—were used in Sackville Street, some thirty years later, to set a baronet's chimney on fire!

Mr. Everard Home.

There remains to be mentioned a very important inmate of Hunter's household, when Clift entered it in 1792—Everard Home, aged 36, brother of Mrs. Hunter and assistant surgeon to St. George's Hospital. Hunter's health had been failing for some years; his arteries had become hard and his heart filled them with difficulty. He had need

of assistance; Home lived in and helped him in his operations, did the night work, read his lectures in the classroom in the Castle Street establishment, and looked after the pupils. Clift found him, on the morning after his arrival, having his hair powdered, engaged to be married and on the best of terms with himself. He was almost patronizing in his attitude towards Hunter's merits. Twenty years before, as a mere schoolboy, and "ambitious to tread the paths of science," he was, so he has told us, "struck with the novelty and the extent of his (Hunter's) researches"! Only two years before Clift's arrival and at a time when Hunter was ill, Home was elected to give the Croonian Lecture at the Royal Society, and read without a qualm of misgiving an essay which, in substance, was Hunterian from beginning to end. In later years he felt he had risen higher than Hunter and was apt to criticize the opinions of his old master.

Let no one think Everard Home was a man of mean ability; he was recognized by his contemporaries as an excellent practical surgeon and a clear-headed man of business. He had a masterful way of dealing with men; he was ambitious—particularly for scientific eminence. He pursued this aim throughout his life with an unexampled diligence, and if only his discoveries had possessed the value he placed on them his career would have been one of unqualified success. All these attributes we must bear in mind if we are to understand the relationship which became established between Home and Clift, ending in the tragedy of the manuscripts.

The Débâcle.

In the spring of 1793, Clift having passed his first year under Hunter's roof, things in the household, although prosperous on the surface, were really moving to a catastrophe. War had broken out with France and Hunter was busy with his duties to the army. The income of the house was large, but the expenditure was lavish. Hunter, to get a supply of ready cash, had been borrowing; he had to accommodate urgent creditors, and Clift, although worshipping the ground on which Hunter trod, was not happy. The suit of clothes he had come in and "the four changes of shirts and neckcloths" were verging on rags; he had no pay, no means of renewing his wardrobe!

> "Then Mr. Hunter, probably to avoid having a footman in green found writing with him in his study, ordered me a coat of twopenny cloth, without a collar, and lined with serge up the fronts to the neck-band, a pair of corduroy breeches and speckled worsted stockings, unbound shoes with leather strings and full of nails. I perfectly remember the respectable appearance I made on that Sunday the new clothes came home. . . . Haynes (the dissecting room assistant) several times gave me a sixpence. . . . so low they (the servants) looked on me. . . . condescended to call me the West Country Hickey, though what it meant I never exactly understood. . . . Not trusted with a candle and therefore I must go back to bed through the dead bones. . . . I had sense enough to know that things could not get worse and must mend."—*From a fragment of his autobiography preserved in the Sherborn papers, Library, R.C.S.*

With Hunter's death on October 16th, 1793, the great Leicester Square establishment came down with a crash. Mrs. Hunter had to leave the house, and for a time her drawing room was occupied by lodgers. The whole staff was dismissed save two: Mrs. Elizabeth Adams, the housekeeper in Castle Street, and William Clift, who was at first allowed one shilling a day board wages to look after the Museum—an allowance afterwards commuted to £21 a year. Home sought to continue Hunter's lectures which were given under the Museum, but after two years he gave up, for he was an indifferent teacher. Clift attended his second course and tried to take notes from him. The care of the Museum devolved on Hunter's executors, Everard Home and Matthew Baillie—both young men struggling for practice. Home was 37; Matthew Baillie (John Hunter's nephew), one of the finest characters to be found in the whole realm of medical biography, was 32; he was chief partner and lecturer in the medical school founded in Windmill Street (Piccadilly) by his uncle William Hunter. He invited Clift to attend the lectures given by himself and by his partner Mr. Cruickshank—a privilege of which Clift availed himself to the full. So far as concerned the Museum and Clift, Everard Home was the senior, dominant, and acting executor. Immediately after Hunter's death he became most prolific in the output of papers—both scientific and surgical. He stepped into Hunter's shoes and attempted to use the Museum and Clift's services just as Hunter had done. In the intervals between Home's visits Clift studied the contents of the Museum and particularly Hunter's manuscripts, which had been removed from the study and were now kept in a small room off the Museum. There was nothing Clift loved better than transcribing, and in these years in which he nursed the Museum alone and worked for Home he copied in his beautiful hand, and for his own use, nearly half of Hunter's writings.

Clift's Finances.

During the seven years which followed Hunter's death, while the Museum lay derelict waiting for an owner, Clift's salary was £21 per annum. We are therefore surprised to find, in 1799, this young man of 25, on the limited income just mentioned, leading a young bride, Caroline Amelia Pope, aged 19, to the altar in St. Martin's Church, Trafalgar Square, and taking her home to the house in Castle Street to set out together for what proved to be a long and very happy journey through life. Fortunately Clift was one who kept a very minute account of his income and expenditure, and when we turn to the ledger in which he recorded his incomings in these seven years we get a clue as to how it was done. At Christmas, 1794, more than a year after Hunter's death, we find that Home has given him a Christmas box of 10s. 6d. "for helping at lectures"; for transcribing the MS. of a book he earned £2; for transcribing the MS. of a novel £1 10s.; for copying a play by Joanna Baillie (for Mathews), £1 1s. At Christmas, 1795, things were looking up a bit; he was paid £5 5s.—the first instalment of his settled salary—and to this he appends the note: "The first money I have received since Mr. Hunter's death—excepting 7s. per week as board wages and tailor's bills for clothes." Then his pencil began to have a market value; Baillie employed him to draw the illustrations for his *Morbid Anatomy* at £1 1s. a plate; he had similar commissions from Monro of Edinburgh, Hey of Leeds, Sir Joseph Banks, and many others.

Home got off cheaply; all his drawings, dissections, inquiries, and odd jobs were done for a Christmas box of £5 5s.; but in 1800, when the Museum had passed into the keeping of the College of Surgeons, a new arrangement had to be instituted. Home had promised, and Clift expected, that his salary as conservator under the College would be fixed at £100 per annum, but £80 was the sum fixed upon. Whereupon Home magnanimously undertook to make the deficiency good by purchasing every Christmas £21 worth of 3 per cent. stock and placing it to Clift's credit until the capital produced an annual income of £21—a promise which he kept, and as we shall see, in later years, claimed thereby to have been Clift's magnificent patron. For this sum Clift supplied his patron with the splendid drawings which adorn a hundred papers published by Home in the *Philosophical Transactions*, besides those in the great volumes on *Comparative Anatomy*. For this sum Clift carried out investigations and experiments for Home year after year; he looked after his papers for him, did his odd jobs at his house in Sackville Street, and was always at his beck and call, although Clift after 1800 was the servant of the College and not of Everard Home.

To this period, too, belongs another important event. In 1799, just before the Museum passed into the care of the College, Home ordered the manuscripts to be removed from Castle Street. Clift loaded a cart with them and conveyed them to Home's house in Sackville Street.

The Board of Curators.

When the College of Surgeons took over the care of Hunter's Museum the managing body, then known as the Court of Assistants, appointed seven of its members to form a "Board of Curators" to look after the new charge. In the summer of 1800 the Board met at Castle Street, and amongst their instructions to their newly appointed conservator were clauses instructing him to live and sleep in the Museum and to accept no gratuities from visitors. Although Home was not yet a member of the Court of Assistants, he was present at this early meeting of the Board and volunteered, with the aid of the Conservator, to prepare a complete catalogue of the collection—an offer

which was at once gratefully accepted. By 1803 Home had been elected to the Court of Assistants, and was naturally appointed a member of the Board of Curators, and thus acquired a dominant influence in the affairs of the Museum. He set Clift down to compile catalogues of all sections of Hunter's Collection; these catalogues were mere lists of contents, but were drawn up with great care and written into folio volumes with meticulous accuracy. Home was too busy looking after his hospital, his practice, and the output of scientific and professional papers to take any part in the work of cataloguing.

Board of Trustees.

In the summer of 1805, on a Saturday afternoon, the Trustees, appointed by Parliament to see that the College of Surgeons carried out the conditions attached to its trust, met for the first time. The Trustees inquired about catalogues and about lectures, and were told that the College had already spent £2,547 on the Collection, and that, as the lease of the Castle Street Museum was almost up, the College had bought for £4,600 Mr. Jenner's house (No. 42) next door to the College House (No. 41) on the south side of Lincoln's Inn Fields as the site of a new Museum. It was resolved by the Board of Curators not "to make the narrow finances of the College the measure of their proceedings." I suspect the phrase is Home's; at least in seeking Government aid to build a new museum, just as on the occasion of the purchase of the Collection by the Government in 1799, Home was chief ambassador in the transaction.

Building of the New Museum.

The houses on the south side of Lincoln's Inn Fields, where the Corporation of Surgeons sought a home in 1796, were built on the same plan as Hunter's house in Leicester Square. The strips of land on which the houses had been erected stretched from Lincoln's Inn Fields in front to Portugal Street behind; the strips were wider but not quite so long as the site on which Hunter had put up his Museum. The College house was No. 41; the next house to the west (No. 42) became the Museum house—where Clift was ultimately to live—and its garden was the site on which the new Museum was to be built. In the spring and summer of 1806 Clift moved the Hunterian Collection from Castle Street* and stowed it safely away in the rooms of the Museum house, until the new building was erected behind; it was not until 1813 that the new Museum was finished and opened to visitors. The conservator's chief duty was to conduct visitors round the Museum twice daily and explain its contents to them. Of this daily duty Clift never tired.

Everard Home as Master.

In 1808, in his 42nd year, Everard Home was appointed Sergeant-Surgeon to the King; he was elected in 1811 to give the first course of lectures on comparative anatomy; the Board of Trustees begged him to publish the lectures, but he modestly declined. Then in 1813, having become Master of the College, a baronet, and having given a second course of lectures, he acceded, with all diffidence, to a renewed request from the Hunterian Trustees to publish, and succeeded in persuading the Board of Curators to spend £165 of the College money on their distribution gratis. It was in the year of his Mastership that the Prince Regent paid a visit to the Museum; a scarlet cloth was spread at the gateway for the reception of the royal visitor. Home's colleagues on the Board of Curators complained that they had not received due notice of so distinguished a visit. The Master excused himself on the ground that the honour was altogether unexpected, leaving his colleagues perplexed to explain the foresight which had provided a scarlet cloth of reception for the occasion.

Renewed Demands for a Catalogue.

The Board of Trustees kept urging the need of supplying proper catalogues for the Museum. In 1816 Sir Everard's colleagues on the Board of Curators were resolving to divide the Museum into sections, each member undertaking the task of preparing a catalogue for one department. At this meeting the Board Sir Everard struck an attitude and demanded that the duty and honour of preparing catalogues must be his and his alone. He made the Conservator arrange an important section of the Museum, wrote a short guide or synopsis for this section, and in the meantime (1817) resigned from the Board of Curators and was elected to the more influential Board of Trustees. He did not in any way lose his prestige in the Court of Assistants, for in 1821, when this body became known as the Council of the College, they elected him to be their first President. Then in 1822 he resumed the Hunterian professorship and gave a course of lectures which his colleagues on the Board of Trustees begged him to publish. He humbly submitted; two more folio volumes on comparative anatomy were issued, rich in plates prepared from Clift's drawings. Again the Board of Curators purchased volumes for distribution.

Burning of the Manuscripts.

It was in June, 1823, just over a century ago, that Clift helped to correct the last proofs of these two handsome tomes of Hunterian lectures. In the spring of this year Sir Everard Home placed certain fossil bones, discovered in caverns near Plymouth, at Clift's disposal for description and publication. Clift gave a very accurate description of them which was read before the Royal Society. Just after this paper was read Home championed the election of William Clift to the Society; on May 6th, 1823, this act of justice was done to Clift—he became F.R.S. We have several letters which show the relationship which existed between Home and Clift at this time: "My dear Clift, Will you dine with me to-day and read over your paper—on the Plymouth fossil bones?—Yours truly, Everard Home." (November 1st, 1822.) "My dear Clift,—I wish you to attend my lecture at the Hospital on Tuesday at 12. Let me have the coloured prints of the blood and the sections of the aneurysm for Tuesday." (January 3rd, 1823.) Sir Everard still held, in the relationship between the two men, the place of patron and master.

On a summer afternoon, July 26th, 1823, Home was driving in his carriage to Kew with two companions—one was William Clift, the other was Robert Brown the botanist and discoverer of the nucleus. They were to attend a small and select society named the Medico-Botanical, of which Home was the leading light. Looking at Clift, Home announced that the night before firemen had forced their way into his house, because his chimney was on fire; he went on to explain that the damage had been done while burning Hunter's papers. "You don't mean," said Clift to the baronet, "you have burned Hunter's manuscripts." Home said he had done as he said; to which Clift relates that he made this reply: "Then, you may as well set fire to the Museum too." One would have supposed that the atmosphere in this coach driving towards Kew would have become sultry, but apparently nothing more happened, and the Medico-Botanicals met and parted as usual. On Home's side there was no trace of a breach, for we find him on September 23rd—two months later—still addressing the conservator, "My dear Clift, You are to be here (Sackville Street) on Saturday at one. Brown and Bauer have already been told, so you have only to write to Aiton." Clift adds a note to this letter saying he was unable to attend on this day. In November it was still "My dear Clift." At this juncture, August, 1823, Sir Everard's co-executor—Dr. Matthew Baillie—died. He never knew the fate which had overtaken Hunter's manuscripts, exactly thirty years after their author's death.

William Clift Turns on Home.

Clift, on returning from Kew, took an early opportunity of telling the chairman of the Board of Curators, Sir William Blizard, Hunter's old pupil, what had happened to the manuscripts. Nothing was done then; the first step was taken in February, 1824, when Clift was called in by the Board of Curators, which included Cline, Norris, Astley Cooper, Abernethy (Clift's particular friend), Anthony Carlisle, and Lynn. Clift enumerated the manuscripts, and

* Mrs. Adams, the housekeeper, refused to move; Clift had to obtain an order from the Board telling her to do so, and also that "she was to take her orders from the Conservator." She died on April 22nd, 1812.

rightly held them to have been an intrinsic part of Hunter's Collection and essential for the preparation of a real catalogue. A month later (March 5th) the Board requested Sir Everard to hand over the manuscripts which they had just learned were, or ought to be, in his possession. On March 9th Sir Everard replied that he had destroyed the manuscripts because they were unfinished and unfit for the public eye; further, he had extracted from them and published all that was essential; and finally, that he had closed his thirty years' executorship by destroying them, which, so he wrote, Hunter had instructed him to do! On March 16th the Board replied to Sir Everard that it could not believe that which his words seemed to imply, and again demanded the MSS. On March 22nd Sir Everard informed them that Hunter had made two last requests to him—one, that his body should be examined; the second, that his manuscripts should be destroyed. In the meantime Clift, who knew the inner affairs of the Sackville Street house almost as intimately as those of his own, had learned that there were still some Hunterian manuscripts in existence. So, on April 6th, the Board of Curators addressed a third letter to Sir Everard, saying that they "had good reason to believe" that he had still Hunterian MSS. in his possession. To this third letter Sir Everard replied, three days later, that he declined further correspondence with the Board of Curators. So the Curators carried, "with painful reflections but in pursuance of duty," the matter to the higher authority, the Board of Trustees.

Sir Everard Home is Tried—and Let Off.

On May 24th, 1824, about six weeks after the correspondence just mentioned took place, the Trustees held a special meeting—ostensibly to consider the preparation of proper catalogues for the Museum. Lord St. Helens was in the chair; Mr. Peel and many other distingushed public men were present. Sir Everard, being a trustee, was also present. He laid the correspondence with the Board of Curators before his fellow Trustees, and begged that it should be entered on their minutes. The Trustees then decided to confer with the Board of Curators, Home having the grace to withdraw when this conference was being held. After the Curators retired he returned, and on being questioned replied that he had destroyed the manuscripts as a duty but he was willing to offer all possible help in the preparation of catalogues. He did help in a small degree, for at the next meeting of the Trustees, on November 27th, he sent a sealed packet, which, when opened, was found to contain descriptions of about fifty of Hunter's own accounts of *post-mortem* examination of cases. At the following meeting, on February 19th, 1825, another sealed parcel came with a like series of Hunter's *post-mortem* records. Clift began to think "the phoenix might yet arise from its ashes," but no more came then. It was at the February meeting, just mentioned, that Sir Everard informed the Trustees. "The Conservator feels himself so outraged at my destroying these papers that he has not only complained to the Board of Curators but asserts that in my whole life I have never done him one act of kindness. In the face of this declaration I beg to state that through me he is now in possession of £1,370 in the 3 per cents." We have already seen how Clift had more than earned this sum. The transaction reflects Home's clever business ability, and at the same time the lengths he was prepared to go to crush one who had given him thirty years of faithful service.

Sir Everard Home's Death.

In his diary for August 31st, 1832, Clift makes this entry: "Reported at the Board of Curators that Sir Everard Home died this morning at half-past three, at his house at Chelsea Hospital; 77th year; of Scots extraction; born at Hull Dec. 6th, 1756. *Sic transit gloria mundi.*" Then, in another entry, he alleges that the glowing eulogium of Home which was pronounced at the Royal Society on the occasion of his death was written by the deceased gentleman himself! Six weeks after his death young Sir Everard Home, Captain of H.M.S. *Racehorse*, handed Robert Keate, the ex-President of the College, a bundle which was found to contain Hunter's famous folio volume on *The Natural History of Vegetables*, and also ten separate manuscript fasciculi. Seven years later (February 14th, 1839), when young Home entered the theatre to hear Edward Stanley deliver the Hunterian Oration, he handed Robert Keate, again the President of the College, another sealed packet. This contained Hunter's folio volume on *Fossils*, wherein we learn that Hunter had been thinking forty years ahead of the geologists of his time. The open page in the Reynolds portrait tells us that he was seventy years ahead of his contemporary anthropologists. Alas! no further discovery of Hunterian MSS. had to be reported.

What was Home's Motive?

What motive led Sir Everard Home to commit such an act of vandalism? Clift supposed, and his supposition has usually been accepted, that it was to keep the public from discovering how many discoveries and observations Sir Everard had stolen from Hunter's manuscripts. I do not believe this to be the true reason. We have seen, in his correspondence with the Board of Curators and Trustees, that he not only admitted but claimed as a merit that he had extracted and published all that was of value in Hunter's manuscripts before burning them! We have seen that Home was vain, ambitious, extremely conventional, and orthodox in his beliefs. Hunter was the exact opposite—he was heterodox; there were in his writings statements which would have made the hair of the orthodox stand on end if *all* his works had been published in 1793. Home declared they were unfit for the public eye, and we may safely infer that he counted Hunter as in error when he was heterodox—Home himself saw the dire fate which overwhelmed William Lawrence when he spoke out his true thoughts concerning man's relationship to animals in the theatre of the College in 1816. Home, fearing the contumely which would descend on Hunter's memory, as well as on the reputation of his living executor, thought he was doing his old and wayward master a true service when he destroyed his unpublished manuscripts. It was vain stupidity—a dangerous possession—rather than criminality, which lay at the root of Sir Everard Home's crowning act of vandalism.

Conclusion.

In 1827 Richard Owen, only 23 years of age, came to Clift's rescue and showed all the world how a catalogue should be written of a great collection of Comparative Anatomy. There is no space in which to tell how James Paget came in 1842 to render a similar service for the pathological side of the Museum. Richard Owen married Miss Clift, and his father-in-law's self-confidence declined as his own grew. Clift's nerve was sapped by the tragic death of his wayward son from an accident in the autumn of 1832. The father hoped to see his son his successor. When the Board of Curators—by then known as the Museum Committee—met on June 7th, 1842, Clift, who was now in his 67th year, was left standing at the door while Owen went in to help in the transaction of business. Clift was presently informed that his salary of £400 per annum was to continue for the rest of his life, that he was to move out of the Conservator's quarters in the College, and that Owen was to move in. He retired to Stanhope Cottage, near Mornington Crescent, off the Hampstead Road, and there, on June 20th, 1849, he died in his 75th year. His wife died six weeks before him. Richard Owen had inscribed on his tomb in Highgate Cemetery: "He carried a child-like simplicity and single-mindedness to the close of a long and honoured career." Faith in himself may have waned, but his faith in Hunter was never shaken.

The data of this lecture have been drawn from the following records and books:

Sherborn Papers in the R.C.S. Library; contains a fragment of Clift's autobiography.

Collection of letters to William Clift from Sir Everard Home and from Sir J. Everard Home, ranging from 1805 to 1840. Library, R.C.S.

William Clift's Museum Diary, 32 vols., from 1811 to 1842 inclusive; preserved in the Library, R.C.S.

William Clift's note-book containing survey of College House and Museum House, Lincoln's Inn Fields, with plan of Museum in Castle Street. Made about 1805.

William Clift: Personal memoranda and accounts. R.C.S. Library, No. 276/h/10, 1794 to 1814.

Ditto. MS. folio in R.C.S. Library numbered 276, containing Clift's memoranda relating to his private expenditure.

Ditto. Note-book. R.C.S. Library, 1800 to 1820.

Ditto. His personal Account book for 1824.

Minutes of the Board of Curators, 1800 to 1850.
Minutes of the Board of Hunterian Trustees, 1805 to 1850.
Stephen Paget: *John Hunter* (Masters of Medicine Series), 1897.
Journal of Caroline Fox, p. 137.
William Lawrence: *Hunterian Oration*, 1846.
Frederic C. Skey: *Hunterian Oration*, 1850.
Dr. James Finlayson: BRITISH MEDICAL JOURNAL, 1890, vol. i, p. 738.
Thos. M. Stone: BRITISH MEDICAL JOURNAL, 1890, vol. i, p. 865.
William Clift: List of Sir Everard Home's papers in the *Philosophical Transactions*. Library, R.C.S.
Ditto. Evidence given before the Parliamentary Medical Committee, 1834. *Lancet*, July 11th, 1835, p. 471.
Ditto. Experiments to determine the Influence of the Spinal Marrow on the Action of the Heart in Fishes. *Phil. Trans.*, 1815, vol. 105, p. 91.
Ditto. Some Fossil Bones discovered in the Limestone Quarries of Oreston. By Joseph Whidbey, F.R.S.; with a description of the bones by W. Clift. *Phil. Trans.*, 1823, vol. 113, p. 81.
Ditto. Some Account of the Remains of Megatherium sent to England from Buenos Ayres by Mr. Woodbine Parish. *Proc. Geolog. Soc.*, 1835, vol. 3, p. 437.
Ditto. On the Fossil Remains of Two New Species of Mastodon and of other Vertebrated Animals found on the left bank of the Irawadi. *Trans. Geolog. Soc.*, 1829, vol. 2, p. 369. *Proc. Geolog. Soc.*, 1834, vol. 1, p. 69.

RECURRENT OR HABITUAL DISLOCATION OF THE SHOULDER-JOINT.

BY

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RECURRENT dislocation of the shoulder-joint is an uncommon condition, the real nature of which appears to be little understood. It may almost be said to be peculiar to athletes and epileptics—a rather curious association which, as I shall show, is not without etiological significance. Most of the former class are powerful, healthy, athletic young men to whom the frequently recurring dislocation from trivial causes is a great and serious disability. In epileptics the dislocation sometimes recurs with every fit. The dislocation is nearly always anterior. I have only seen one case of posterior recurrent dislocation. That case was in a woman, and she was not operated upon.

The condition has been attributed to abnormal laxity of the capsule of the joint, and to weakness of the surrounding muscles. The abnormal laxity of the capsule is supposed to be due to stretching or imperfect healing of that structure after the reduction of an ordinary traumatic dislocation, and it has been thought that too early and too vigorous use of the arm may be the cause of the defect.

Various Operations.

Two types of operation have been performed for the relief or cure of this disability: (1) Operations designed to diminish the size of the capsule. These comprise various folding, pleating, plication, or overlapping procedures, with or without incision or excision of a portion of the capsule. (2) Operations designed to give support to the capsule, particularly at its lowest part where the dislocation is believed to take place during movements of abduction. The most favoured of these operations is that of Clairmont and Ehrlich, in which a strip of the deltoid muscle is transplanted in the form of a sling beneath the joint, and is supposed to contract and hold up the head of the humerus when the arm is abducted.

Both these types of operation are based upon erroneous ideas of the pathology of recurrent dislocation of the shoulder. In the first place, the capsule in these cases is not unduly lax. The capsule of the shoulder-joint is normally a lax structure, but more than one surgeon has commented upon the difficulty of raising a satisfactory fold when doing a plication operation for recurrent dislocation. Secondly, the muscles are not weak. There may be a little wasting after this, as after any other injury to the shoulder-joint, but the powerful musculature that is usually exhibited by these patients is a sufficient commentary on this point. Thirdly, the joint does not need support below, for it is not here that the dislocation takes place.

It must be admitted that these operations have sometimes been successful in preventing the recurrence of the dislocation, but this result has usually been due to limitation of the normal movements of the joint by the operative procedure. One surgeon, indeed, has suggested that the operation might be simplified if it were done deliberately with this purpose, and he proposed to graft a band of fascia between the chest wall and the humerus in order to limit the movement of abduction to 60 degrees.

Causes of Recurrent Dislocation.

It has been too readily assumed that recurrent dislocation is an unfortunate sequel of ordinary traumatic dislocation, and I have known medical men reproach themselves quite unnecessarily for their treatment of the original injury. Recurrent dislocation has nothing whatever to do with ordinary traumatic dislocation of the shoulder-joint. It is an entirely different injury, and it is produced in an entirely different manner.

Ordinary dislocation of the shoulder is the commonest of all dislocations of the joints. It is caused by a fall on the abducted arm. In extreme abduction the neck of the humerus impacts against the acromion process, and by leverage the head is forced through the lowest and weakest part of the capsule between the subscapularis and triceps muscles. When such a dislocation is reduced, the rent in the capsule heals rapidly and soundly, and the dislocation rarely, if ever, recurs.

But the dislocation which afterwards becomes recurrent is caused, not by a fall on the abducted arm, but by a fall either directly on the back of the shoulder or on the elbow which is directed backwards and only slightly, if at all, outwards. The head of the humerus is forced out of the joint, not by leverage, but by a direct drive from behind forwards. In its passage forwards the head shears off the fibrous capsule of the joint from its attachment to the fibro-cartilaginous glenoid ligament. The detachment occurs over practically the whole of the anterior half of the glenoid rim. The reason why the dislocation recurs after reduction is that, whereas a rent in the fibrous capsule heals rapidly and soundly, there is no tendency whatever for the detached capsule to unite spontaneously with the fibro-cartilage. The defect in the joint is therefore permanent, and the head of the humerus is free to move forwards over the anterior rim of the glenoid cavity on the slightest provocation.

In quite a number of the cases the original injury is stated to have occurred at football, and it should be noted that in this game, at least, a player is seldom sent sprawling with his arms out, but, when he falls or is thrown to the ground, it is usually in some moment of strenuous action, when his muscles are tense, and his arms are more or less close to his sides. Usually he is too preoccupied to make much attempt to save himself, and in falling backwards he is likely to strike either the back of the shoulder or the point of the elbow, which is directed backwards. The epileptic, too, falls with his muscles tensely contracted, and he, of course, makes no effort to save himself. Frequently the arms are drawn backwards and little, if at all, abducted. So that, if he falls backwards, he is likely to strike either the back of the shoulder or the point of the elbow. Thus both athletes and epileptics are liable to sustain dislocation of the shoulder-joint by direct violence rather than by indirect force or leverage.

Some cases have been described in which fractures, either of the anterior margin of the glenoid cavity or of the greater tuberosity of the humerus, have been associated with recurrent dislocation. Such fractures have not been seen in any of my cases, but it is easy to see how they might be caused by the direct force which produces the initial dislocation. They must, however, be regarded as incidental, and not essential, to the recurrent dislocation. The essential feature is the detachment of the capsule from the fibro-cartilaginous glenoid ligament.

The Operation Recommended.

I have now exposed this typical lesion at operation in four consecutive cases. A satisfactory exposure cannot be obtained by the anterior incision ordinarily employed for arthrotomy and plication operations on the capsule, and

no doubt this is the reason why the condition has not been generally recognized. The operation which I have done has been planned to expose completely the anterior margin of the glenoid cavity.

A small pillow or sandbag is placed beneath the scapula, so as to keep it forwards. The arm lies on the table by the patient's side, and it is rotated inwards, so as to relax the pectoralis major muscle. The incision extends from the upper border of the clavicle above the coracoid process downwards and outwards for about five inches. The deltoid and pectoralis major muscles are separated, and the coracoid process and the three muscles attached to it (pectoralis minor, biceps, and coraco-brachialis) are defined. Perthes, who used a similar incision in operating upon fractures of the glenoid, divided the pectoralis major, but I have not found this step necessary. The coracoid process is next divided with an osteotome or bone forceps, and drawn downwards with the three muscles attached to it. Lastly, the tendon of the subscapularis is divided close to its insertion, and this muscle is retracted inwards.

The damaged area is now fully exposed. Internally one sees the neck of the scapula with the fibro-cartilaginous glenoid ligament lying upon it. This ligament has usually been torn up a little way from the glenoid margin, so that it appears as a free edge lying upon bare bone. External to this is the glenoid cavity with the head of the humerus in contact with it. Running from above downwards over the joint cleft is usually to be seen a band of fibrous tissue which represents the free edge of the capsule which has been torn from the glenoid ligament. It appears as a band because immediately external to it is the not inconsiderable and perhaps enlarged opening of the subscapularis bursa. Lastly, external to this is the fibrous capsule of the joint covering the greater part of the head of the humerus. The mechanism of the recurrent dislocation can now be easily demonstrated, for on taking hold of the arm and pushing its upper end forwards, the head of the humerus can be made to pass freely over the anterior edge of the glenoid cavity.

To anyone who has seen this typical lesion exposed at operation it must be obvious that the only rational treatment is to reattach the fibrous capsule to the glenoid ligament whence it has been torn. It is clear that a plication or similar operation performed on some distant part of the capsule can only have the effect of drawing the detached edge outwards and further away from the glenoid margin. No doubt, if the capsule is sufficiently diminished in size, it may prevent displacement of the head of the humerus notwithstanding the defect at the glenoid margin, but this is at the expense of free movement in the joint. It should be remembered that the capsule of the shoulder-joint is normally a lax, and not a tense, structure.

It is exceedingly difficult to believe that operations of the Clairmont-Ehrlich type can have any influence in preventing recurrent dislocation, except by limiting the normal movements of the joint. Even if one could think that the transplanted strip of muscle acted in the way it is supposed to do, it is not clear how this would prevent the dislocation, for the displacement does not take place downwards, but forwards.

In my cases the joint defect has been repaired by interrupted sutures of silkworm gut passed between the free edge of the capsule and the glenoid ligament. It is well to freshen the bone on the neck of the scapula, so that the glenoid ligament may adhere to it. Having repaired the joint defect, the divided subscapularis tendon is reunited, the detached portion of the coracoid process is sutured in place, and the wound is closed. After the operation the arm is kept at rest for four weeks, and then active and passive movements are begun and persisted in until the movements of the joint are normal.

Two of my cases were epileptic, and both the others sustained the original injury at football. One case—a powerful epileptic—had some limitation of abduction two months after operation, and he has not been seen since. This relatively poor result was due to his neglect of after-treatment. The others recovered full movement at the shoulder-joint, and in none of them has the dislocation recurred.

TREATMENT OF MIGRAINE BY CALCIUM LACTATE.*

BY

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MIGRAINE, passing under many names and treated by a host of different remedies, is a condition of surpassing interest on scientific grounds alone. To practising physicians the condition is of similar importance for three reasons: (1) Migraine is a very common ill; although referred to by those who have never suffered from it as a minor malady, yet in reality it accounts for an enormous amount of wretchedness and impaired efficiency. (2) Migraine appears to attack with great frequency the professional classes in general and medical men and women in particular. In the literature splendid accounts of the condition have been supplied by doctors who were themselves sufferers, and in my series of twenty cases eight were members of the medical profession or medical students. (3) The old treatment of migraine, as evidenced by the long list of so-called remedies, is not satisfactory. More recently fresh conceptions and new drugs have been tried with some success, and the results obtained with one of these remedies is the justification for this communication.

It appears probable that the fundamental cause of migraine is an anaphylactic shock. How this shock is manifested, and indeed in what particular part of the brain the manifestation occurs, is not known. The accurate, subjective localization of the headache and the external phenomena associated with the superficial temporal artery suggest the area of the brain underlying the squamous portion of the temporal bone as the probable site of the lesion; the occasional aphasia and even rarer hemiplegia met with in migraine point to the motor cortex. On the other hand, the visual phenomena, which are so common, can only be explained by referring the disturbance to the occipital cortex, and the vomiting is possibly associated with the medulla. It has been suggested that the pituitary gland may undergo temporary enlargement and thus cause symptoms, but the type of hemianopsia met with in migraine is opposed to this view. It would appear, therefore, that no single cerebral area can be held responsible for the various phenomena of the disease.

The undoubted relation between eye-strain and migraine is difficult to explain upon an anaphylactic basis unless it be that a brain already sensitized will react unduly to any stimuli and among them impulses connected with the ocular apparatus. On the other hand, the equally well known connexion between migraine and other nervous disorders, such as epilepsy, can best be explained on an anaphylactic basis; these conditions also are considered by many to have a similar origin. On this assumption it is not exactly correct to say that migraine is hereditary, but rather that a liability of the nervous system to become sensitized and react to certain stimuli in themselves innocuous may be transmitted. Migraine in the parents may be represented by asthma or angio-neurotic oedema in the children.

It is remarkable that organic disease, especially perhaps that of the cerebral vessels, is not more often associated with migraine, for temporary aphasias and hemiplegia are comparatively common in the former (Case v).

Of the symptoms occurring in the attack those connected with vision come first in point of time and in importance, since they may be the sole manifestation. A sudden general dimming of vision is a very common prelude, followed by scotomata, coloured dazzling spectra, and hemianopsia. These constitute the aura of an attack and, as might be expected, they are often associated with vertigo. In a short time follows the headache, which is usually localized very accurately to one temple and practically always to one side of the head. The least movement or any temporary increase in intracranial tension, as by coughing, is accompanied by

* Based upon a note read before the Liverpool Medical Institution on January 4th, 1923.

agonizing pain. Nausea, terminating in retching and vomiting, completes the painful picture. The whole attack may last only a few hours or be prolonged for a day or two. All the stages of the typical migraine attack just described may not be present in any given case. The ocular symptoms alone, or the headache alone, frequently occur, and even nausea and vomiting may be the sole manifestation of an attack (Case III). In the last eventuality grave mistakes in diagnosis may be made.

It will be plain from the formidable list of drugs used in combating migraine how unsatisfactory our treatment is. Following upon accustomed lines the treatment of a paroxysmal malady is best discussed under the headings: (1) measures used between attacks, and (2) measures used during attacks.

Measures Used Between Attacks.

Under this heading prominence must be given to the importance of correcting refractive errors. There are grounds for supposing that slight errors, which are sometimes regarded by oculists as negligible, may be more potent as migraine producers than are the obvious ones, in which owing to their magnitude the ocular mechanism appears to give up the unequal contest of correction.

Under this heading, too, must be considered methods for desensitizing the nervous system so that it can no longer respond to anaphylactic toxins after its migrainous habit. A full account of such measures has been given by Pagniez.[1] Good results are described from repeated small doses of horse serum and crotaline and from taking peptone on an empty stomach. I have had no experience with these remedies, but judging by the poor results of this line of treatment in epilepsy I am not encouraged to pursue them.

Treatment During Attacks.

This heading is more comprehensive. A strenuous brain worker cannot go to bed in a darkened room with cold towels round the head and all the other paraphernalia of the luxurious sick-room. If modern medicine can offer nothing better than this to a man whose living depends upon working many hours every day at high pressure then the subject of migraine might well be excluded from practical textbooks. Fortunately the picture is not so gloomy as this, for one of the following two lines of treatment offers a reasonable hope of success. The first is the use of sedative drugs, and of these two are particularly helpful. Phenacetin in the hands of Byrom Bramwell has proved a potent weapon.

He writes:[2]

"I order the patient to take a 20-grain powder of phenacetin as soon as the attack occurs. I tell him, if the first powder does not relieve the headache, to take a second at the end of an hour; and if the second does not cut short the attack to take a third at the end of another hour. I attribute the success which I have had from phenacetin, in a very large number of cases, in which the remedy had been previously given by other practitioners or taken by the patient on his own initiative, to the large doses which I give."

Luminal, as advocated by Wilfred Harris,[3] is also worthy of trial. Not more than 3/4 grain three times a day should be taken, and even this dosage may be reduced considerably. Apparently drowsiness is the great objection to the use of this drug.

The second means of attack is the one upon which I wish to lay particular emphasis. For some time I have been using calcium lactate in migraine with success. The only reference to this drug as a cure for headache that I have been able to find in the literature is in a paper by Ross.[4] Here is reported the cure by calcium lactate of cases in which headache is associated with oedema, anaemia, and lowered coagulability of the blood. Among these cases are two of migraine and these also were relieved by this remedy. Calcium lactate is also popularly supposed to cure the morning headache following an evening's gaiety.

The method of administration in migraine is as follows: At the first sign of the approach of an attack, as evidenced by the ocular aura, 30 grains of calcium lactate must be taken immediately; as there must be no delay, the drug must be constantly carried by sufferers, and for this purpose the tablet form is essential. The tablets must be made by a reliable firm and they must be fresh. I have seen instances in which tablets carried in the pocket for some time gave no effect, while the use of a fresh solution, procured from a chemist near by, gave speedy relief. It must be clearly understood that no claim is made that calcium lactate as given above cures migraine, merely that it aborts the attack and in many cases prevents the appearance of the headache and vomiting and enables the sufferer to continue at work.

Description of Cases.

CASE I.

Medical woman, aged 35. For the last eleven years has been troubled with migraine—very marked visual phenomena, including hemianopsia, severe headache, but no vomiting. Attacks, in spite of many drugs, lasted about two days. Though the onset was usually associated with fatigue and eye-strain and a strong light appeared to precipitate an attack, there was no refractive error. During the last eight years every attack has been aborted by calcium lactate and the headache stage has in no instance been reached. In no attack since calcium treatment was begun has work been interfered with, while formerly in some instances a day, or even two, were spent in bed. Also the attacks have become more and more infrequent.

CASE II.

Medical man, aged 28. For many years has had headaches of two distinct kinds—the one is true migraine and the other is apparently due to some alimentary toxaemia. The migrainous attacks since taking calcium lactate have been entirely aborted, whereas the other type of headache is absolutely uninfluenced by the drug.

CASE III.

Female clerk, aged 24. For some years has had attacks of vomiting preceded by hemianopsia but no headache. In March, 1921, the patient consulted me for attacks of vomiting which lately had been of daily occurrence; these sometimes were associated with visual aurae, but often not. The general condition was naturally very bad and the girl was becoming more and more depressed. Calcium lactate 30 grains was ordered to be taken every night for a few weeks with occasional breaks. The result was quite marvellous: the symptoms disappeared immediately and, owing to the cessation of the attacks, the general health rapidly improved. The doctor reported later that the patient was her old happy self again and quite free from attacks. In this case it would appear that warding off the migraine paroxysms, with their resulting weakening effects, enabled the patient to build up her general condition so that with better health the migraine habit was broken.

CASE IV.

Married woman, aged 53. Consulted me in October, 1922, for paroxysmal headaches from which she had suffered all her life. The three stages of typical migraine were experienced. Apparently refractive errors were present, but the correction of these gave no relief. Calcium lactate was ordered, and shortly afterwards her son, himself a medical man, reported that the first attack of migraine was always completely aborted by the treatment, but that a second one often occurred a few days later and then the drug did not give relief. Accordingly luminal, 3/4 grain twice daily, was ordered, and this combined with the calcium gave very good results. In August this year her son wrote saying that his mother's attacks formerly kept her in bed two days in every week, now the attacks are much slighter and she is able to get up in a few hours after a paroxysm. "My mother never goes away from home without a full supply of tablets and powder."

CASE V.

Married woman, aged 63, first consulted me in September, 1920, for a curious condition of her hands and feet. The appearance was that of a combination of Raynaud's disease and erythromelalgia, and there was acute tenderness added. Though marked arterio-sclerosis was present calcium lactate gave wonderful improvement. In August, 1922, she again consulted me, but this time for typical migraine attacks in which all the stages were represented. Again calcium lactate was successful. There can be little doubt but that the condition of the vessels in this case played a part in the causation of both affections.

CASE VI.

Married woman, aged 29; seen in September, 1921. For the last year had suffered from weekly attacks of pain behind the eyes lasting for hours. There was no headache nor vomiting. No errors of refraction were present. A tentative diagnosis of migraine was made and calcium lactate was tried. Two months later the report was "quite cured."

CASE VII.

Woman, aged 22 (medical student). When 14 years of age suffered from eye-strain which was relieved by glasses. While reading for the final examination this summer headaches became so bad that even using the eyes for a few minutes for reading was impossible. Oculists were consulted and various remedies tried, but without success. She consulted me as to the advisability of trying calcium lactate. I agreed to this as an experiment. In a précis of her case she reported later, "Calcium lactate grains 30 whenever the headache started was then tried and found to relieve it in about three hours, the effect lasting one and a half to two days." She has now resumed hard work. This patient also suffers from chilblains, but on this condition the drug has no effect.

In neither of the last two cases could a diagnosis of migraine be made and yet the result of treatment was very satisfactory.

CASE VIII.

Medical man, aged 33. Occasional attacks of migraine for some years with marked visual phenomena and headache but no vomiting. In 1922 there were five attacks within a short period and in four of these absolute and immediate relief was obtained after taking calcium lactate. In the fifth attack no supply of the drug could be obtained and the consequent headache lasted for more than twenty-four hours. After this an error of refraction was corrected and the attacks ceased.

CASE IX.

Medical man, aged 26. Typical migraine attacks unaccompanied by vomiting since February, 1923. I ordered calcium lactate in the usual dose. He reports (October, 1923) that he has experienced eighteen attacks, of which fifteen were aborted by the treatment and no headache resulted. In two of the remaining three attacks no calcium lactate was taken and in the third the dose was taken too late, with the result that headache followed in each instance.

CASE X.

For notes of this case I am indebted to Dr. E. I. Claxton of Bootle. Woman, aged 47. This patient had had recurrent headaches, showing all the typical events of the migraine syndrome, since she was 7 years of age. At first the attacks were at monthly intervals, but since reaching the age of 30 they have become more frequent. In November, 1922, luminal was exhibited, but this drug, even in small and widely separated doses, made the patient so drowsy that its use had to be discontinued. Speaking of this patient the doctor wrote in a letter received in September of this year: "After hearing your note read at the Liverpool Medical Institution on January 4th, 1923, I put her on a 30-grain dose of calcium lactate, which must be taken within half an hour of the appearance of the visual symptoms. This aborts the attack; the only time it failed was when she neglected taking the dose within the prescribed half-hour." He adds: "I feel convinced that this drug is the only one that has given relief to a patient who has been a life-long sufferer from migraine." It is only fair to add that in a verbal communication Dr. Claxton has since informed me that quite recently the patient has vomited on one or two occasions.

Dr. J. Flanagan of Bootle reports that he has tried my method of treatment in three typical migraine cases occurring in women during the last nine months. The attacks were aborted in all.

No object is to be gained by multiplying such examples; suffice it to say that, in my series of 20, 16 patients stated that their attacks have been aborted by the calcium lactate treatment. Of the remaining 4, 2 were apparently cured by general remedies and consequently had no need to try calcium, and 2 experienced no relief. Of these two apparent failures one is a medical man whose case is complicated by a gunshot wound of the skull, and in his attacks he experiences great pain in the region of the scar; the other is the wife of a friend whom I have only treated by proxy, and possibly she may not be suffering from true migraine at all.

It is not right that definite conclusions should be drawn from such a small series of cases. Nevertheless, I have taken the opportunity of publishing my results in order that this treatment may be tried on a wider scale and its efficiency proved.

REFERENCES.

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THE NATURE AND TREATMENT OF SPRUE.*

BY

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VARIOUS theories of the causation and modes of treatment of sprue have been advanced, but hitherto treatment has been almost entirely empirical. The method I wish to bring forward has at least the merit of a rational basis. The best way in which I can briefly place before you the line of reasoning on which the theory first originated is to relate the history of a patient a consideration of whose symptoms and progress formed the basis of the theory.

The patient in question contracted the disease in China in 1920. The usual symptoms were present: the loss of weight was rapid, sometimes 3 lb. in a week, and the mouth symptoms were very severe. On more than one occasion there were over thirty aphthae in the mouth, so that the taking even of milk was painful. These spots are spoken of as aphthae, but they differ from what we usually recognize under this term. After a bout of "acidity"—burning pain in the stomach with acid rising into the oesophagus—there would ensue in twenty-four hours or so a crop of four or five very tender spots on the tongue, the fraenum, or the level of the second molar, or on the gums and cheek. There was nothing visible at this early stage, but in a few hours small red patches would develop which in another twenty-four to thirty-six hours would break through or become abraded and intensely painful little ulcers would appear.

Another symptom not mentioned in the books, but very marked in this case, and in many others whom I have questioned, was cramps, or rather carpo-pedal spasms. Tetany is spoken of, but the former is, in my opinion, much more common. During the night the patient frequently had to spring out of bed and pace the floor to relieve these cramps of the legs and feet; when writing, cramps of the hands would come on, so that the penning of more than a brief letter became impossible.

He suffered many things of many physicians. He took nearly all the yellow santonin there was in the colony; he was given autogenous vaccines (*Streptococcus salivarius* and others), emetine injections, was dieted with milk at one time, with the Salisbury method at another, with a diabolical preparation to which sprue itself is, in my opinion, preferable—namely, liver soup—at a third. Finally, he was sent on a voyage to Canada with the idea that a "spell of cold weather would drive out the sprue."

After some months, during which he became progressively worse, he managed to crawl with aid on to a vessel for England, and arrived in March, 1922. He was taken into hospital the following day, fortunately under the care of one who had for years been studying the disease both at home and in its endemic centres abroad. Confinement to bed and a milk diet for some weeks led to considerable improvement, and the patient went to the country to convalesce. Any attempt, however, at passing on to even decent invalid food led to more sore mouth, more flatulence, acidity, large stools, loss of weight—in fact, to a return of the typical symptoms. Two relapses occurred during the ensuing nine months, and the patient was invalided from the service in consequence. At each of the relapses the cramps returned as badly as ever.

I now began to ponder whether it was not possible to trace to some common origin these various symptoms. Dyspepsia and large pale, pasty motions are amongst the earliest manifestations. The stools show a relative excess of fatty acids and a relatively large excretion of calcium. The urine also in some cases contains more calcium than normal. The flatulence, acidity and diarrhoea, the aphthae, languor, and loss of weight, might all arise from states of intestinal intoxication. Next came to mind the peculiar association of carpo-pedal spasms with calcium deficiency, the correlation possibly of these with the diarrhoea and intestinal toxins, referring them to the group of organs which have been credited with the control of both these conditions—the parathyroids. These are believed to have a twofold function—namely, the regulation of calcium metabolism and of detoxication, in particular of the poisons of intestinal origin. In addition to this, but as subsidiary and not acting in all cases, is the condition of hyperchlorhydria. If this is present we may have as a result an excessive production of secretin by the action of the acid of the gastric juice upon the prosecretin of the mucous membrane of the duodenum. Excess of secretin leads to stimulation of the pancreas with an increased splitting up of fats, so that the normal ratio of neutral fats to fatty acids is diminished, as I have detailed in a former paper. This, however, is but a side issue, and does not come into play in all cases, for in sprue the gastric contents may show hyperchlorhydria, normal acidity, or hypochlorhydria.

Here was enough to start on. Examination of the blood revealed the fact that the total calcium was little, if at all, diminished, except in later stages or in very severe cases, nor was the coagulation time prolonged. The inference, therefore, was that in spite of the loss of calcium in the excreta sufficient was being absorbed to maintain the normal total calcium in the blood.

Calcium, according to the researches of Vines and Grove, is present in the blood in two forms—the ionic or free, and the combined or coagulative. Seeing that the latter was

* Read at a meeting of the Section of Tropical Medicine and Parasitology of the Royal Society of Medicine (see page 1157).

not deficient, although the symptoms pointed to calcium deficiency, it was inferred that the ratio between the two might possibly be upset. In the blood plasma there is normally between 10 and 11 mg. of calcium per 100 c.cm., of which 6.5 mg. or thereabouts is in the ionic state and the remainder combined. This latter fraction is concerned with the process of coagulation, and during the clotting this 4 mg. of "combined" calcium becomes changed to free calcium, due to the breaking down of a calcium-lipoid complex. In normal persons the whole of the 10 mg. should, after the blood has clotted, be in the free state in the serum—that is, there should be no residual combined calcium. In conditions of so-called "calcium deficiency" the blood after clotting is found still to contain some calcium in the combined form, and there is thus a relative deficiency of ionized calcium.

Calcium in the form of the lactate was then prescribed for the patient and the symptoms improved, but though the drug was continued relapse took place. Further increase of the calcium led again to improvement, followed again by relapse. Perhaps the augmented intake brought the ionic calcium temporarily to the normal, and the relapse would then be explainable by the ratio again becoming, or still remaining, disarranged. The amount of the calcium was then reduced and parathyroid extract was given. I am not sure now whether the former drug need be given at all, since the food as a rule contains sufficient calcium for the needs of the body. A wonderful change took place. Developed aphthae rapidly healed, commencing ones, as sore papillae and tender spots, receded without becoming aphthae, the flatulence was diminished, the stools became fewer and smaller, the colour began to return, and the general sense of well-being was regained. Within so short a time as a fortnight all the more acute symptoms had disappeared; food was increased, calcium was stopped, and in five weeks the patient was on ordinary diet. The parathyroid was gradually left off, and in six weeks from its first employment was stopped altogether. Nearly eleven months have gone by and he has lived a normal life, working hard Sundays and weekdays, paying no regard to diet, taking alcohol on occasion, and has not had a day's illness since.

This is not altogether an exceptional case. I have records of other patients who have done nearly, some quite, as well; one even better.

Let me now briefly review the symptoms associated with calcium deficiency, or, as it is preferable to call it, irregularity of calcium metabolism, and see how they apply to the disease we are discussing.

When the European goes to the East—for instance, to India—he continues to indulge his preference for a meat diet and partakes also of some of the native dishes, such as curries and highly seasoned rice. His thirst is slaked by iced drinks, often sweetened, and sometimes containing a considerable quantity of alcohol. His diet there is thus in several ways unnatural, and hyperchlorhydria is common. The effect of this I have already mentioned elsewhere.[1] Gastric and intestinal disturbances are commonly associated with stomatitis and aphthae. The excess of acids in the food also plays a notable part in sprue; the saliva itself is, in many cases, acid.

In other countries where sprue is endemic—China and Porto Rico for example, to instance places in the Far East and in the West—the food and the methods of cooking lead to an increased ingestion of fats. Kochmann and Petzsch by adding fats to the diet of healthy dogs showed that a considerable loss of calcium occurred, while Rothberg and others noticed that in children to whom an excess of fats was given the retention of calcium was reduced. This they explained by the increased formation of calcium soaps in the intestine, unabsorbed fatty acids being eliminated in the stools as soaps of potassium, sodium, and calcium, leading thereby to the impoverishment of the body in respect of bases. Again, Korenchevsky found that in animals on a diet deficient in calcium diarrhoea was noticed, together with such symptoms as loss of weight and increased nervous excitability.

How far vitamin action comes into play I do not venture to say, though, according to Aulde, a lack of calcium when vitamins are supplied induces the same changes in the endocrine glands as are seen in conditions where calcium in the diet is abundant but the vitamins are deficient. In other words, vitamins are unable to fulfil their function in the absence of inorganic salts.

In calcium starvation (accompanied by deficiency of fat-soluble factors in the diet) there is a considerable loss of calcium and phosphorus from the organism. Korenchevsky found in his experiments that administration of calcium salts under these conditions led to a temporary improvement in the balance of calcium, but as soon as the extra intake ceased the retained calcium was soon excreted. Before I came across the account of Korenchevsky's work I had stated that this was what probably occurred in sprue. The taking of calcium led to improvement of symptoms, but the dose had to be increased because, so I inferred, it was being improperly regulated. If we think for a moment of the nutrients recommended for sprue—certain fruits, milk, carrots, young spinach, potatoes—we see that all are characterized by an excess of bases and a richness in calcium.

The amount of calcium in the blood does not depend solely, or even in the main, upon the amount of calcium salts taken in the food or as medicine, but on the efficiency of the calcium-regulating mechanism—the parathyroids with their twofold function of detoxication and regulation of calcium metabolism. The mechanism of this regulation would naturally be upset if the toxins were more than could be dealt with, and the absorption of certain toxins appears to lead to such disturbance; the ionic calcium suffers diminution and becomes relatively deficient first, while in the later stages there is an absolute deficiency. Calcium deficiency is therefore regarded as an indication of toxin absorption.

In cases of sprue, then, we have one of two conditions. In the one where fats are in excess we have an excessive excretion of calcium in addition to intoxication of intestinal origin; in the other protein excess with intestinal toxin formation. In both, the parathyroid detoxicating function is overburdened, with a resultant disorganization of its calcium-regulating function, while there may be in addition diminished calcium absorption. Both functions, therefore, of these glands are interfered with.

A few figures of the calcium content of the blood of a normal person and of patients suffering from sprue are given in the table. The specimens were sent to Dr. H. W. C. Vines, of the Cambridge Medical Schools, Fellow of Christ's College, who very kindly undertook to examine with regard to their calcium content specimens of blood sent up. He was not told the histories of the cases when the specimens were sent, and I think it will be agreed that the results obtained afford remarkable corroboration of the theory I have brought forward.

Table of Calcium Contents of Blood Normal and in Cases of Sprue.

	Free Ca.	Combined Ca.	Total in mg. per 100 c.cm. serum.
Normal (after clotting)	10.7	0.0	10.7
McG. Fairly severe case.			
Before starting treatment	6.1	3.8	9.9
After one week	8.1	1.8	9.9
After two weeks (good progress) ...	10.1	0.0	10.1
H. S. Average case. Not taken on arrival. Weight 118 lb.			
After one week (gained 3¾ lb.)... ...	7.0	2.9	9.9
After two weeks (weight 127 lb.) ...	7.4	2.7	10.1
After three weeks (weight 133¼ lb.) ...	10.8	0.0	10.8
After four weeks (weight 142¾ lb.) ...	10.8	0.0	10.8
C. W. Mild case; nine months ill. (Bombay.)			
Before starting treatment	8.0	1.9	9.9
After two weeks (to have fish, chicken, potatoes, milk, biscuits, carrots, eggs	8.9	1.2	10.1
After three weeks (to have meat, beef, mutton, ordinary food. After four weeks, reported himself quite well, 2 lb. above normal weight.	10.4	0.0	10.4

It will be seen that in a case of somewhat severe sprue before commencing treatment there was a reduction of

[1] *Trans. Roy. Soc. Trop. Med. and Hyg.*, February, 1923.

more than one-third in the ionic calcium, though the total was very little reduced. In all, as they progressed, this figure went up, almost *pari passu*, and when the free calcium reached normal and there was no residual combined calcium the patients expressed themselves as feeling well and very hungry, and there were no untoward symptoms.

In my previous paper records were given of individual cases and also an explanation, or possible explanation, of the rationale of the modes of treatment in vogue. There is no need to repeat these, but as Sir Leonard Rogers believes so strongly in the efficacy of vaccines in this disease and has reported many good results, I may perhaps be allowed to say a word or two on that head, as it bears on my own theory. According to what I have advanced the detoxicating function of the parathyroids becomes overtaxed; it has been working overtime, as it were, for probably a considerable period, and has finally had to succumb or at least take a temporary rest. The organism cultured from the mouth or stool is only one of several which may have had a hand in the toxin production, and the effect of the vaccine would be to render one of the foes *hors de combat* and reduce the inimical influences to such an extent that the parathyroids can now cope with them, especially when the treatment is combined with mental and bodily rest in bed and an addition of calcium by a diet consisting largely of milk. This explains, I think, the good results obtained from so many different vaccines, provided they are autogenous.

> "There are twenty different ways
> Of writing tribal lays,
> And every single one of them is right,"

says Rudyard Kipling. It may be the same in sprue. Twenty different men might find twenty different organisms, make vaccines from them, and report good results in each case, for they might each have hit off an organism responsible, in part at least, for the toxin produced in each individual patient, and by combating it relieve the overworked parathyroid and enable this gland to take up its duties again. But no single vaccine would prove effectual in all cases, and we may thus explain the individual good results of streptococci in some of Sir Leonard Rogers's patients, of monilia in Ashford's, of coliform bacilli in various others.

Another form of treatment, highly commended by some in the Far East, is powdered crabs' eyes and cuttle-fish shell. I do not know the chemical composition of the former, but the latter contains much calcium. Another favourite medicine is pulvis Bataviae co. What is this but concentrated calcium?

It has already been stated that the foods found best for sprue patients contain quantities of this base. In a word, the best diet and the most successful drugs hitherto used have supplied abundant calcium, a base which serum analyses have shown to be deficient—sometimes absolutely, more often relatively—without exception in those tested so far. The constituent parts are ill balanced, and the disease, therefore, calls imperatively, not so much for a more abundant supply of calcium as for support in regulating its disposal—that is, for parathyroid. The rest in bed, which is important in the early stage of treatment, puts the whole system under the best conditions for recovery of function.

When I wrote the last communication on this subject I could only speak of patients treated in England, but I stated that it would be of interest to know whether such felicitous results could be obtained abroad as I had had here with cases which, by the great kindness of the physicians to the Hospital for Tropical Diseases, I had been permitted to see in addition to those whom I myself had treated outside. I have since had reported to me the cases of eight patients in the Far East all of whom had been under the usual methods of treatment for one and a half years or more. One had come to this country for treatment, and, having been kept for a long time in hospital, had been obliged to return. He was assured that he would not live through the voyage, and, in fact, was carried ashore on a stretcher. He started the calcium and parathyroid treatment; in three weeks was up and about, and in five was carrying on his business.

If such fortunate results can be obtained in countries where the disease is endemic (and in most of these its prevalence appears to be increasing), much sickness and invaliding will be avoided and not a few deaths prevented, a marked contrast to what obtains at present—a miserable voyage home on ship's food, a stay of several months in hospital on the diet of a toothless infant, followed by months of food restriction, an ever-present haunting dread of a recurrence of symptoms, and a veto on any idea of a return to a tropical climate; in other words, the ruin of many a young man's career.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF MEDICINE.

Sir THOMAS J. HORDER, Bt., M.D., F.R.C.P., President.

DISCUSSION ON CHRONIC BRONCHITIS.

I.—JOSEPH JOHN PERKINS, M.A., M.B.CAMB., F.R.C.P.LOND.,
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THE subject before us this morning, which may seem a very simple one, was chosen in deference to the feelings expressed by Branches that bronchitis was well worth discussion, on account of the frequency of these cases in practice and the high death roll that follows—the Registrar-General's figures for 1920 were 1,010 deaths per million living.

The Branches felt that little advance had been made in treatment, except perhaps that with some men a routine use of vaccines has taken the place of a routine giving of expectorants, and they hoped that a comparison of counsels which Sophocles has said is characteristic of the wise, might lead to improvement in treatment and even might help towards prevention also.

The Committee agreed and accepted the suggestion, but decided that the time at our disposal would not admit of a discussion of the whole subject, including acute bronchitis and pulmonary lesions consequent on bronchitis. They therefore limited the subject to recurrent and chronic catarrh of the trachea and bronchi.

I shall be brief in my opening remarks, and will first outline the ground which will be covered this morning.

Catarrh, one may say, is immediately due to invasion by infecting organisms. Dr. Inman and others will deal with the bacteriological aspect of the subject and the value to be placed on vaccines. But we may go deeper than the question of immediate treatment, and consider the possibility of prevention. Preventive anticatarrhal inoculation is a method largely used, of the value of which many members hold a high opinion. This, we hope, will come into the discussion this morning, and we expect to get some solid information from their experience.

Further, are there not conditions which predispose in individual cases to recurrent bronchitis and invasion by micro-organisms? If such can be found and dealt with treatment and prevention will be placed on a sounder footing. In other words, to use the well known simile, the soil should be borne in mind as well as the seed.

Predisposing conditions would seem to fall under the following heads: (1) The part played by occupations and trades; on this Professor Collis has sent in a short statement in which he emphasizes the importance of "atmospheric pollution" in the causation of bronchitis. His paper, with full statistics, will appear in print shortly. (2) The part played by climate in causation and treatment. (3) How far are pre-existing local pathological conditions present, especially in the upper respiratory tract, in these patients, with the result that they carry in themselves a

constant reservoir of micro-organisms ready to infect the bronchi by aspiration? These are local predisposing conditions in the nose and pharynx, but (4) Are there no general constitutional factors in these patients, which prepare the way for infection, and which well considered treatment could seek out and remove? Before the the morning is over I feel that we shall have reason to see that these suggestions are well founded, that in a large number of the cases of chronic and recurrent bronchial catarrh such predisposing conditions, atmospheric or personal, and in the latter local or general, are certainly present and that they are the key to the position, too often overlooked or perhaps not sought.

For myself, I draw a distinction between chronic or recurrent bronchial catarrh and a single acute attack of bronchitis. A single acute attack, it seems to me, may occur in anyone without special predisposing conditions; it is a matter of opportunity, the result of a sufficiently virulent microbic infection which the patient chances to encounter, and which may overcome even a stout resistance. For the single acute attack I find the ordinary drugs very useful and vaccines so valuable as to be truly curative. But when catarrh recurs frequently or becomes chronic and constant, vaccines, I find, are more efficacious in relieving symptoms, such as cough or spasm, in which they are undoubtedly very useful, than in curing. In fact, as the sceptic puts it, in chronic bronchitis as you chase out one microbe another takes its place. In such chronic cases my experience leads me to look for a pre-existing or underlying predisposing condition, and I believe one can be found in a surprising proportion of cases; on the treatment of this underlying condition success depends.

Among the predisposing conditions none is so common, in my experience—and I wish this to be my particular contribution to this morning's discussion—as some chronic diseased condition of the upper respiratory tract—mouth, tonsils, pharynx, nose—a local reservoir of microbes, as I said before, from which infection of the bronchi by inhalation can easily take place. Unless this focus of infection is dealt with, other treatment, including vaccines, is futile.

Bad pyorrhoea, unhealthy tonsils, a foul pharynx, nasal disease or trouble of all kinds, whether mechanically obstructive or infective only—these are the lesions I find so frequent, and believe to lie at the root of so many cases of chronic or recurrent bronchitis, and the treatment of which I find to be so effective in preventing the bronchial catarrh. I allow this is well enough known in a general way, but it is not sufficiently realized or acted on in practice. The frequency with which in childhood adenoids predispose to bronchitis is a truism, but similar conditions, such as those just named, are true for the adult. The nose and pharynx should never be overlooked. It is unnecessary for me to pursue the matter in detail, as Mr. Seccombe Hett will deal with it later.

To touch on other predisposing factors which require attention, if treatment of chronic bronchitis is to be effective, in many cases metabolic conditions are the key. Here I place obesity, whether its effects be toxic or mechanical, overfeeding (the so-called gouty bronchitis), and alcoholic excess. For these patients self-denial in food and drink and reduction in weight (by graduated exercise, massage, the Turkish bath, and spa treatment), a reduction of the intake and an increase of the output, to promote elimination and restore mobility to the chest, are necessary.

I wish, then, to urge the importance of such predisposing conditions as I have named, local and general, especially the local, in the causation of recurrent attacks of bronchial catarrh. Neglect of these factors I respectfully suggest is one of our two main failings in dealing with recurrent bronchitis. Our other fault, I believe, is our failure to continue our efforts until a really satisfactory convalescence is secured. We are too apt, as soon as an attack has subsided, to rest on our oars and think that everything necessary has been done, whereas we should still press on until we secure a return to the former active life.

I refer here to the importance of the preservation or restoration of the open-air habit of life, and the value of respiratory exercises. Fresh, pure air is of value not only for the consumptive. In chronic bronchitis, as Professor Collis will tell us, contaminated impure air is the enemy, not chills and exposure. It has been well said that no one ever "catches cold" while deer-stalking in the Highlands—only on return home.

The bronchitic should cling to the open-air life or habit as long as possible, and postpone as late as possible the evil day when he is shut up in the hot stuffy rooms to which he is too prone—the beginning of the end. A change to a milder climate, after being laid up indoors, is, of course, a useful stepping stone to the resumption of ordinary life; and a good general plan for the bronchitic is to take the usual annual holiday in the winter, securing a change to some place where outdoor exercise is freely possible and pleasant. Such a break helps many a patient to get through the winter without an attack, and, reinforced by the following summer, puts him in a strong position to face the dangers of the coming winter.

With such simple precautions the bronchitic can be kept in fair working condition for several years. Ultimately, in the later stages of the malady, permanent residence in a warm climate may possibly become a necessity, but that should be reserved for the later stages. A bracing climate should be adhered to as long as possible, and that climate is sufficiently warm which allows of daily open-air exercise. The climate of the Alps, pure dry cold, has long been known to be of great benefit in the earlier stages of the complaint, and many a bronchitic does not fear cold provided the air is dry. On this point I cannot do better than quote a letter received from an old medical friend, now well in the seventies, who suffers much from catarrh in London. He writes: "I am wonderfully well. I went off on May 10th to stay with a friend on the Welsh moors, 1,500 feet above the sea; heard on my arrival that they had had four inches of snow round the Lodge that morning. I arrived in a snowstorm; we had gales and blizzards every day till May 21st, then gales and hail. We often found the ground white in the morning, but we got some gleams of sun. I was out all day, and four days we went into the valley to fish. In spite of the weather I felt as fit as possible and lost my cough almost entirely. Nothing like fresh air."

It is often impossible, I know, to alter a man's occupation or get him an expensive climatic change, but we can improve the conditions of his life in office and home; we can do away with the heated atmosphere, which acts as an incubator for microbes. The atmospheric pollution which, you will hear later, Professor Collis finds to be the main source of bronchitis, does not apply only to "trade dust." We can keep up the practice of outdoor exercise and encourage the hardy habit of body which defies chills.

Finally, a valuable adjunct in the treatment of the bronchitic is to be found in respiratory exercises, such, for example, as have been successfully systematized by Mr. Cortlandt MacMahon of St. Bartholomew's Hospital. In most people the lower portions of the lungs are habitually hardly used, and the object of such exercises is to restore and even increase the movement of the lungs. They carry with them also the improvement in oxygenation and circulation which follows increased activity. Training in singing has often, in earlier life, the same effect in banishing a catarrhal tendency.

Briefly, MacMahon's system is divided into two courses. The first course aims, by a series of inspiratory exercises carried out in the recumbent position, at increasing the movement of the lower ribs and developing the inferior lateral region of the thorax. By this means the lower chest is expanded and the action of the lower part of the lungs improved. When this has been attained the patient is taught, in the second part of the course, to contract the abdominal muscles and drive the diaphragm forcibly upwards. By the combined movement he is educated to make the most of his lung capacity, and once thoroughly learnt the improved breathing becomes habitual. The result of this powerful increased respiration, inspiratory and expiratory, is to bring into play the large area of lungs towards the bases which is ordinarily unused, and so to add many millions of air cells to those already in action.

Work is less exclusively thrown on the upper part of the chest; the faulty tendency of the bronchitic towards

quick shallow breathing of the upper chest type is overcome; respiration is deepened and markedly slowed. It goes without saying that at the same time aeration and circulation, both of blood and lymph, are promoted; the nutrition of the lung is improved thereby, congestion and oedema disappear, cough is markedly diminished, and the heart is relieved. The total effect on the bronchi and lung is to bring the whole organ into that state of functional activity which stands for health and resistance to invading organisms.

In conclusion, while not undervaluing our present methods of treatment of chronic bronchitis, I beg to suggest, first, that important predisposing conditions are often present, the treatment of which is essential, and that medicinal measures, whether by drugs or vaccines, do not cover the whole ground; but that it is important by pure air, exercise, and even by special respiratory exercises, to maintain and increase the functional activity of the lung. On the one hand, by removing foci of infection, we can do much to prevent catarrh. On the other, after an attack, by enjoining, with suitable precautions, the value of pure fresh air and exercise of the lung, we can do much to defend the patient from sinking into a chronic

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II.—J. ODERY SYMES, M.D.LOND.,
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THE VACCINE THERAPY OF CHRONIC BRONCHITIS.

If we exclude the chronic catarrhal conditions which arise from irritation by dust, or such as are seen in cardiac and renal conditions, we may regard chronic bronchitis as essentially an infective disease. The resistance of the individual is lowered by chill or by illness, and the organisms which are normally present in the nasopharynx are enabled to establish themselves in trachea and bronchi and set up inflammatory changes there.

It is my purpose to-day to discuss briefly the bacteriology of chronic bronchitis, and more particularly its treatment by vaccines. In no branch of vaccine therapy have I met with greater success than in the treatment of chronic bronchitis. Occasionally one fails to obtain a favourable result, but speaking generally an improvement may be assured and frequently a cure established. I have never seen a case made worse by vaccines. This favourable result has not been only in my own practice, but I have received, from the majority of medical men from whom I have inquired, reports which are very largely favourable to this method of treatment. Personally I am opposed to the use of stock vaccines, but I have received several reports from doctors who have found them invaluable both from a prophylactic and curative standpoint. The organisms most frequently responsible for the continuation of cases of chronic bronchitis are in their order of frequency the pneumococcus, various streptococci, and the *Micrococcus catarrhalis*. Pfeiffer's bacillus, Friedländer's bacillus, and staphylococci are also frequently found.

Unfortunately it is much more common to find two or three varieties of organisms in a sputum than to obtain what is practically a pure culture. It is this multiplicity of organisms in the sputum which militates against the success of vaccine therapy and which makes it imperative that peculiar care shall be taken in the collection and treatment of the material from which the vaccine is to be prepared.

Collection of Material.

In cases where sputum cannot be obtained satisfactorily—that is to say, where the mouth is septic or where for a time the bronchial symptoms are in abeyance—a nasal swabbing may be taken, as suggested by Mackey. He has shown that in cases of chronic bronchitis the exciting organisms are constantly present in the nasal passages, and there is less chance there of contamination with extraneous organisms.

Preparation of Vaccine.

In making a nasal culture it is well to introduce the swab through a glass tube which is inserted into the nostril and so protects it from contact with the skin, hair, and dried crusts, which are found at the meatus and which would otherwise be a source of contamination. West's swab, as generally used for the nasopharynx, is excellent for this purpose. If the vaccine be prepared from the sputa then the patient should be directed first to wash out the mouth and to gargle with sterile water, and then to cough up and expectorate into a sterile vessel. It is better that these procedures should be carried out at the laboratory so that the plates may be inoculated immediately while the material is fresh and warm. If, however, this is not possible the tube or swab should be promptly sealed, placed in the waistcoat pocket, and at once conveyed to the laboratory. Any delay in the inoculation of plates—such, for instance, as is entailed by transmission by post—very much diminishes the probability of securing an efficient vaccine, for it may suffice to allow of the death of delicate organisms, and the multiplication of saprophytic varieties. The whole success of a vaccine may depend on this speedy transference of the material to the nutrient medium.

It is not my province to trespass on the technique of the bacteriologist, but I cannot leave this subject without saying that the preparation of the vaccine calls for much fine discernment and careful consideration. A film of the material should be stained and those organisms selected which are evident in the film and which show the freest growth on the various culture media. The vaccine should not be prepared from subcultures as this procedure much attenuates the strength of the organisms. If possible the bacteriologist should have the opportunity of seeing the sputum in bulk and should be given a history of the case. The manufacture of a vaccine for chronic bronchitis is an art—there are no set scientific principles—and some bacteriologists are more successful than others. From the foregoing it is evident that stock vaccines are not likely to meet with more than a modicum of success, and when it is remembered how many different strains there are of pneumococci and streptococci and how widely they differ one from the other, there can be no doubt that for successful treatment one must rely on the autogenous vaccine.

Dosage.

In the matter of dosage there is great variety of opinion, but one thing is essential—namely, that the dose be sufficient to excite reaction—a local reaction at the site of inoculation, and a mild general reaction—for example, malaise, slight rise of temperature, and a temporary increase of cough and expectoration. An overdose may result in a temporary set-back, and shake the confidence of the patient. It is well, therefore, to begin with small doses—say, 5 million of each organism—and gradually and at short intervals to raise the dose until a reaction is obtained.

The interval between the early tentative doses should be five days, and when once reaction is established this may be lengthened to seven days. If reaction is excessive, causing distress to the patient or a rise of temperature of more than 1°, the size of the next dose should not be increased, or the interval should be prolonged to ten days.

The essential point to remember is that the administration of the vaccine is not a mechanical process but a scientific procedure, requiring the same watchfulness and careful adjustment as the administration of digitalis in a case of failing compensation.

Vaccine treatment of bronchitis must be prolonged over a period of at least three months although the immediate symptoms may have disappeared, the object being not merely the amelioration of the present condition but also the establishment of a high degree of resistance. Preferably a new vaccine should be prepared at least once during such three months' course, as certain of the organisms which were originally present may have died out or fresh varieties may have supplanted them. In the same patient the bacteriology of successive attacks of bronchitis (winter recurrences) is seldom identical, so that it is no use relying for treatment on a vaccine founded on past experiences. One patient of mine, a lady whose chronic bronchitis is complicated by dilatation of the bronchi, has had vaccines prepared from her sputum or nasal passages on six occasions between 1910 and 1923. On each occasion the flora has been different—(1) *Micrococcus tetragenus* and streptococci; (2) streptococci and *M. catarrhalis*;

(3) pneumococcus; (4) pneumococcus and *M. catarrhalis;* (5) streptococcus and *M. catarrhalis;* (6) streptococcus and pneumococcus.

If the bacteriology of successive attacks were always the same it would be possible to raise the resistance of the patient and ward off future attacks by administering every few weeks prophylactic doses of the particular organism. Although this is not practicable I think a useful purpose is served by administering during quiescent periods prophylactic doses of one of the various stock vaccines, which are sold for the prevention of catarrhal conditions. Such generally contain streptococci and pneumococci, *M. catarrhalis* and *B. influenzae.*

Clinical Results.

The first effects of the vaccine are seen to be, almost in all cases, alleviation of the cough and diminution in the quantity of sputum. Together with this there is nearly always an improvement in the patient's general health. Gradually cough and expectoration should entirely disappear. The type of case, in my experience, which benefits most is that in which there is bronchiectasis, either a single bronchiectatic cavity or dilatation of many of the tubes. For instance, a middle-aged man with chronic bronchitis and a large right-sided bronchiectasis was found during March, 1922, to have an infection by pneumococci and streptococci. A vaccine was administered in doses rising from 25 to 3,000 million in eight injections, lasting over six weeks. All his symptoms were cured by that time and he left the hospital. Similarly a child of 11 years of age, in whom there were signs of multiple dilated tubes and in whom the sputum was abundant and fetid, was admitted in May, 1923. The infection was a mixed one, *M. catarrhalis* and pneumococci. A vaccine was given in doses of 10 to 200 million, with intervals of three days. The cough and expectoration rapidly diminished. A second culture was made from the sputum at the end of three weeks and the same organisms were found. Further doses varying from 250 to 1,500 million were administered, and all symptoms had disappeared in six weeks. In this case the cough, expectoration, and vomiting had persisted for four years and the fingers were beginning to show signs of clubbing.

It is stated that cases of chronic bronchitis which are due to a single type of organism are those which are most certainly benefited by vaccine therapy, and that the pneumococcus and *M. catarrhalis* cases are peculiarly susceptible of relief. Such cases of a single infection are, however, very rare, and none have come under my notice. One would naturally regard them as being most favourable for an autogenous vaccine. Very striking results are sometimes obtained in cases of chronic bronchitis complicated with asthma such as one frequently sees in middle-aged persons. Here the use of an autogenous vaccine results in the relief not only of the bronchitis but almost invariably of the asthma also, and by persistent inoculations one is able to ward off attacks for many months, and to mitigate the severity of attacks when they return. I should, however, like to emphasize the fact that care must be taken in treating asthma with a vaccine, as it is a foreign protein. It often happens that a dose of vaccine will precipitate an attack by introducing the protein to which the patient is hypersensitive. In these cases much patience and care is required in cutting down the dose so that gradual immunity can be established. These cases may certainly be made worse by indiscriminate dosing with large quantities.

Immunity.

It can certainly be claimed for vaccine therapy that it establishes a fairly long immunity—the intervals between the exacerbations of chronic bronchitis become longer and the severity of the attacks diminishes. Absolute immunity is seldom or never secured. Of course one does meet with cases of chronic bronchitis in which vaccine therapy fails. Such failures are probably due to some error in the preparation, dosage, or administration of the vaccine, and can only be eliminated by repeated bacteriological examination of the sputum and by the preparation of new vaccines of varied combinations and strengths. Failure may also be due to some constitutional disorder in the patient, which has been overlooked, such as gout, emphysema, arterio-sclerosis, or cardiac insufficiency.

Speaking generally, we have in vaccine therapy the most potent of all our weapons for the prevention, cure, or amelioration of chronic bronchitis. Its use, of course, does not contraindicate the employment at the same time of all lesser remedies—drugs, hydropathy, climatic treatment, or other remedial measures.

III.—E. HYLA GREVES, M.D.EDIN., F.R.C.P.LOND.,
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CLIMATIC TREATMENT OF CHRONIC BRONCHITIS.

PRACTISING, as I do, in a winter health resort like Bournemouth, one meets with all varieties of chronic bronchitis, chiefly, of course, amongst the well-to-do, ranging from the comparatively simple cases of recurrent winter cough to the severe types of chronic catarrh with profuse and sometimes fetid expectoration. It is frequently assumed that the starting-point of chronic bronchitis is an acute catarrh of the respiratory mucous membrane, influenzal or otherwise, which, in susceptible subjects, frequently recurs, ultimately drifting into chronic catarrh. There are many, however, who refuse to recognize the existence of a primary bronchitis in any circumstances, except in those cases where there has been prolonged exposure to dust—for example, in millers and stonemasons—and one cannot help being struck with the frequency with which in many cases of so-called chronic bronchitis a much more serious affection is present, the bronchitis being only a secondary manifestation. I refer to conditions like gout, arterio-sclerosis with high blood pressure, chronic kidney disease, heart disease, chronic alcoholism, and obesity, and last, but not least, tuberculosis, and until these diseases are excluded the diagnosis of chronic bronchitis is untenable. My own observations lead me to think that a considerable number of cases of chronic bronchitis are really secondary to what is termed peribronchial tubercle—frequently associated with more or less pulmonary fibrosis; and I think there is a growing tendency to regard the chronic bronchitis and emphysema of old age as manifestations of pulmonary tuberculosis. Careful inquiry into the early history of these cases often reveals the story of an attack in early life of pneumonia or bronchopneumonia, following either measles or whooping-cough—probably leading to a hilum tuberculosis of a chronic character, which may remain quiescent for years, and show itself in later life in chronic bronchitis of a very obstinate type. I have occasionally received a rude shock in the discovery of tubercle bacilli in the sputum of a case hitherto regarded merely as one of ordinary chronic bronchial catarrh. Prolonged search is often required to find tubercle bacilli in these cases, and not infrequently they cannot be found at all. An *x*-ray examination often reveals disease of the lungs which the stethoscope has failed to detect. It is, therefore, in the interests of the community that a periodic examination of the sputum for tubercle bacilli should be made in all cases of chronic bronchial catarrh of a severe and unyielding type.

The presence of disease of the upper respiratory passages must not be overlooked, as they are often the source of a chronic catarrh of the bronchi—but this question will be fully gone into by other speakers.

In the treatment of chronic bronchitis climate plays an important part, for there is no class of case more susceptible to changes of temperature than the bronchitic, and in selecting a suitable winter climate for him it is essential to bear in mind certain important points—namely, equability of temperature, sunshine, shelter from wind (especially from the north and east), and dryness of subsoil. Fortunately the South of England provides several suitable health resorts fulfilling these conditions—namely, Southsea, Bournemouth, Ventnor, Sidmouth, Torquay, Falmouth, and Penzance. But before deciding upon any specific line of treatment it is necessary that any underlying or predisposing condition should be recognized and dealt with as far as it is possible to do so. In the North of England, especially in the Dale country, it is a common practice amongst the old and feeble to take to their beds in winter and to remain there till the

spring—in other words, to hibernate; this accounts for the large number of very old people in these parts, for there is no doubt that many old people precipitate the final catastrophe through exposing themselves to severe cold in winter. The sudden drop of temperature which occurs in the early hours of the morning often accounts for acute exacerbations of bronchial catarrh in the aged, and it is important to protect them from this by keeping the temperature of their bedroom at a suitable level, but overheated rooms and overclothing are to be strongly deprecated. I am convinced that the custom of keeping chronic bronchitics in overheated rooms is largely responsible for keeping up and increasing their susceptibility to changes of temperature. Gradually accustom them (if not too old and feeble) to living and sleeping in comparatively cool rooms, and you will do much to restore their resistance to cold—just as happens in cases of phthisis when submitted to open-air treatment. A house with a southern aspect, and not surrounded by trees, should be selected.

As regards the treatment of chronic bronchitis generally, it is of the utmost importance to recognize the underlying condition of which bronchitis may be merely a secondary symptom. The irritable winter cough of elderly people is frequently associated with definite gouty or rheumatic diathesis, and must be treated accordingly by diet and general measures to counteract the diathesis. Such cases often derive much benefit from a course of treatment by sprays and inhalations at Mont Dore, also at Harrogate, Buxton, Bath, and other English spas.

The habit of deluging the unfortunate patient with drugs of the expectorant variety is happily rapidly dying out, and in their place the use of vaccines has become the vogue. Other speakers will enter more fully into their use, but I should like to emphasize the necessity of having the culture taken direct from the patient at a pathological laboratory—if this is not possible, that means should be taken to keep the culture swab or sputum warm. For if it becomes chilled, the organisms causing the catarrh will fail to develop when cultivated. With this precaution I think many of the failures could be avoided. As a prophylactic measure to protect the patient against acute exacerbation of the catarrh, I think vaccines are of considerable value.

The method of continuous inhalation of dry vapours, after the method of Burney Yeo, or the various forms of vaporizers, often gives very definite relief, especially where associated with a tendency to bronchial spasm. But this leads in the direction of asthma, which would require in itself more time than the whole allotted to this discussion. I should like to draw attention to the value of dry cupping over the bases in the treatment of acute or subacute exacerbation of the catarrh, especially when the bases become engorged and dyspnoea and cyanosis become pronounced and the right side of the heart embarrassed. This method is universally practised on the Continent, but has fallen into disuse in this country. The relief it gives is often quite definite.

IV.—MICHAEL G. FOSTER, O.B.E., M.A., M.D.CAMB., F.R.C.P.LOND., Harrogate.

CLIMATIC TREATMENT ABROAD OF CHRONIC BRONCHITIS.

I HAVE been asked to devote myself to the climatic treatment of chronic bronchitis. Part of the ground has been already traversed by Dr. Hyla Greves; I would, therefore, confine my remarks to treatment abroad. As in every other disease, the first question with which we are confronted is, Can the disease be arrested? To my mind too little consideration has been given to those cases which are drifting into chronic, or, in the strict sense of the term, lifelong bronchitis. A man between 35 and 45, who has probably suffered from colds from his youth upwards, begins every winter or spring attacks of cough with expectoration; year by year these attacks become longer, the cough more persistent, the sputum harder to get up; the moral being that there is slight increase of emphysema with each winter.

He becomes increasingly careful, avoids night air, muffles up; the general upshot of his coddling is in the main increased susceptibility. In this type of case a sojourn in the Alps for a winter or even a month or two may effect a complete cure. The rarefied air opens out the alveoli gently, in place of the jerky distension due to cough, fresh areas of lung tissue are opened up, and the bronchial tubes are enabled to empty themselves. In addition the dry air tends to a lessening of secretion. Such a course of treatment will often entirely renovate the bronchial tree.

I can call to mind a very distinguished man in the scientific world who thirty years ago had such constant attacks of winter cough that his friends were anxious as to whether he could continue his duties. He went for a month or two to the Engadine for two or three years, and now, hard on 70, is in robust health and full activity. The sojourn should be undertaken in the winter, first on account of the invigorating effects of dry cold, secondly because the air is drier and more aseptic when the snow is on the ground. Two cautions should be observed: the heart and arteries must be sound, sleep normal, and the chest walls must not show any marked rigidity. The late Dr. Huggard laid great stress on the fact that cases with rigid chest walls never did well in the high Alps; subsequent experience by others has confirmed this dictum. I wish to urge the importance of such a method, and the advantages to be derived from its early employment.

Spa treatment affords another useful method of benefiting these cases. The methods employed are largely variants of that originating from Ems. The procedure consists in spraying the throat with pulverizations of varying fineness, regularity being ensured by working the machine with compressed air, whereby the force can also be adequately controlled.

This treatment is carried out with the same machinery with natural mineral water at English spas—Harrogate, etc. At Mont Dore in Auvergne, which has acquired a great reputation for the treatment of asthma, a like treatment is carried out by means of sprays of arsenical water. The cure is enhanced by the effects of altitude. Similar methods of inhalation are carried out with sulphur water at Cauterets and Luchon in the Pyrenees. At Salso Maggiore the patient sits in an atmosphere of finely pulverized bromo-iodine water.

Turning to the next type of case in which bronchitis is firmly established, whether in consequence of persistent winter cough or spasmodic asthma, the position is entirely different. Repeated congestive attacks have largely bereft the bronchial mucous membrane of ciliated epithelium, emphysema has impaired the elasticity of the lungs; consequently what the French term *nettoyage des bronches* is an operation performed with steadily decreasing efficiency. Treatment in such cases must aim at the reduction of irritating qualities in the inspired air with a view to lessening secretion. Warmth and absence of fog are the fundamental requisites; to those for the majority of cases may be added dryness of the air, though some cases are more benefited by a moist climate. It has been a traditional custom to send these cases to the Riviera, to Algiers, Egypt, or the Canary Islands. The value of climate has, to my mind, received striking confirmation of later years from the occurrence of what I may term experimental bronchitis. I refer to the sequelae of gas poisoning. These cases are not of common occurrence, and as far as my observations go are due either to chlorine, or occurred in the period July to September, 1918, when—as many of you will remember—some of the cases sent to the base differed from ordinary cases of mustard-gas poisoning. In cases such as these we have examples, not of slow degenerative changes in the bronchi and lungs brought about by years of repeated attacks of congestion, but the whole bronchial tree, previously in a perfectly healthy condition, changed at once into a state like to that produced by years of winter cough. The fundamental pathological change in chronic bronchitis is loss of ciliated epithelium. When we reflect on the *post-mortem* appearances seen in cases of gas poisoning—the sloughy mucous membrane of the trachea and the raw bronchi—the pathological analogy becomes apparent. I have been much struck by the influence of the Riviera climate in the cases which have come

under my care. The amount of expectoration diminishes shortly to about a half, with concomitant lessening of cough and dyspnoea. In this instance we are dealing with the aftermath of a local condition suddenly induced in a healthy man in the entire absence of a constitutional cause. I had for many years observed the same result in cases of chronic bronchiectasis which had lost their fetor. In such cases the amount of sputum rapidly diminished, the moist sounds becoming audible only in the cavity itself, while the generalized bronchitis entirely disappeared. I quote these instances only to emphasize the local effects of dry warm air rather than any constitutional effect of climate. What, then, are the most suitable climates? It has been an old rule, which has been proved worthy of acceptance, that cases with excessive expectoration do best in a dry warm climate, those with hard cough and scanty expectoration do best in a warm moist climate. As regards the Riviera, the western Riviera is drier than the eastern. Cases with scanty expectoration are probably better off at Rapallo than further east. Another point is that cases in which asthma has developed consequent to chronic bronchitis should always live above the sea-level. As small an elevation as a hundred feet may make all the difference as to frequency of paroxysms. Hyères, the higher parts of Cannes, Mentone, or San Remo are, therefore, most suitable. Rome, Florence, Naples, cannot be regarded as health resorts. The island of Sicily is, moreover, too changeable in the winter for bronchitic invalids. Arcachon and Biarritz are climatically intermediate between England and the Riviera. Cases of chronic bronchitis would in the main do better by going to the latter. Algiers is somewhat more humid, and suitable for cases with scanty expectoration. Egypt is probably the ideal place for certain months for cases with profuse expectoration. Madeira and the Canaries are suitable for cases with scanty expectoration and irritable cough. In the end we have to answer the question, Is change of climate other than palliative? If we order a man into exile, have we any assurance that he will be good for much eventually? For the first class of case the answer I should give would be an unhesitating "Yes." Men and women do not grow out of bronchitis. In the second the lives of the elderly are prolonged and rendered easier, and any middle-aged patient can, by timely climatic treatment, completely clear up an attack of bronchitis, and may keep the enemy at bay.

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CHRONIC BRONCHITIS IN RELATION TO NOSE AND THROAT INFECTIONS.

I HAVE been extremely interested to hear the preceding papers, and I only wish that, having had nearly twenty years at ear, nose, and throat work, I could have twenty years as a physician so that I could have some of their experience with regard to chronic bronchitis.

I should like to say as a dogma that all cases of chronic bronchitis are descending infections from the upper respiratory tract—the mouth, nose, throat, larynx, and trachea. Of course, every case I have seen of chronic bronchitis has of necessity been due to infection from the area in which I have been interested, and consequently I have not had the opportunity of seeing any cases of primary chronic bronchitis, if indeed such cases occur.

To start at the beginning of life, children with bronchitis usually have a poor airway through the nose and unhealthy tonsils and adenoids. The removal of these very frequently cures the condition even in fat rickety children. It is true that operation is generally associated with medical treatment, including proper diet, hygiene, etc., but I cannot exclude the establishment of a proper airway and the abolition of sources of sepsis as at any rate a prominent factor in the improvement which occurs. In young adult life, from 15 to 25, nasal obstruction, due to a traumatic septal deflection or a narrow nose from neglected adenoids and tonsils in childhood, is a very frequent cause of cold-catching and chronic catarrhal rhinitis.

If neglected, this condition is very apt to lead to chronic bronchitis in middle age or later life. A chronic catarrhal condition of the nose is established, muco-pus is constantly passing down the post-nasal space and in voice users leads to laryngitis and tracheitis. Winter bronchitis follows on the exacerbation of the catarrh due to fresh invasions of autumn and winter catarrhal infections and finally the bronchi, being chronically infected, secrete muco-pus even during the summer, so the patient is never free from a certain amount of bronchitis. Finally, a specially virulent infection occurs and the patient succumbs to an acute attack of bronchitis or pneumonia. Such patients are especially liable to post-operative pneumonia because the soil is ripe.

Nasal infection sooner or later generally leads to nasal sepsis. This may be limited to chronic infection of the nasal mucous membrane with acute exacerbations, but is likely to spread to infection of the lining membrane of the nasal accessory sinuses. These are, of course, merely an extension of the nasal mucous membrane. If the outlet of the infected sinus becomes blocked and an acute condition supervenes, the patient is often lucky because the condition is treated and the nose rendered healthy by operative or other treatment. In chronic sinus cases the patient may complain of no symptoms except, perhaps, some catarrh, and the descending infection gradually progresses until a chronic bronchitis is established.

I need not weary you by a recapitulation of a series of cases, but two cases come prominently into my mind and I think are worth quoting. A patient between 50 and 60 had had chronic bronchitis for twenty years. He always coughed up a large quantity of muco-purulent secretion every day. His heart was acting badly, his complexion very sallow, and his lips bluish.

He was sent to me because, despite his careful life and the fact that he wintered in the places recommended by his doctors, he nearly died each winter from an acute attack of bronchitis or bronchopneumonia which supervened on his chronic condition. On examination he had a very narrow obstructed nose and was a confirmed mouth-breather with projecting front teeth and a markedly gothic palate. The right side of the nose contained multiple polypi issuing from the ethmoidal cells, and a stream of thick pus could be seen oozing from under the anterior end of his right middle turbinal bone. On transillumination the right antrum was dark and on taking a radiogram the right frontal sinus and antrum were found to be opaque.

He was taken into a nursing home and kept there for ten days until an acute attack of bronchitis from which he was suffering had subsided. I then did a submucous resection of his septum, curetted the right ethmoid, did an intranasal operation on the antrum, and enlarged the infundibulum so that his frontal sinus could drain. He made a good recovery, and after washing out the frontal sinus and antrum for some time and putting him on a course of autogenous vaccine, his health and colour were much improved, he lost his frontal headache, and the secretion from the chest practically disappeared. He has had no bad attack of winter bronchitis since, and ten years after is a much better life than he was previously.

The second case was one of prostatectomy in a man of 65 who had had chronic nasal catarrh and frontal pain for many years. I was called to see him after the preliminary stage of the operation, which was done under a general anaesthetic. Following on this he had an acute attack of bronchitis which nearly killed him. The condition persisted with continued secretion from the bronchi, and the second stage was done under a spinal analgesia. I washed out the left frontal sinus and antrum, put him on local treatment, and he then had a course of autogenous vaccine. All his bronchitic symptoms have cleared up and he is in excellent health.

Just as nasal obstruction leads to sepsis and a descending infection, so does undue patency of the nose. In a case of congenital or acquired syphilis the septum may be destroyed together with the lateral ethmoid masses and with them the middle turbinals. The nose becomes dry and crusted and an atrophic naso-pharyngitis follows. The process may extend downwards, due to destruction of the pharyngeal

mucous membrane and its replacement by scar tissue; laryngitis, tracheitis, and bronchitis easily follow. A similar process occurs in atrophic rhinitis and in undue patency due to trauma, operative or otherwise.

Tonsillar infection in adults is, in my experience, less likely to lead to chronic bronchitis than nasal infections. Recurrent tonsillitis and quinsies are apt to lead to chronic ill-health and in voice users to laryngitis, with weakness and hoarseness of the voice.

Oral sepsis is undoubtedly a factor in the production of chronic bronchitis, and people of middle age with septic teeth and pyorrhoea would be well advised to part with their teeth if they have bronchitis.

Hay fever, paroxysmal rhinitis, and asthma are part of a syndrome and can be conveniently discussed together in relation to chronic bronchitis. They can, perhaps, be defined as abnormal reactions to stimuli which affect the upper respiratory tract.

Essentially hay fever is produced by undue sensitiveness to pollen which causes acute congestion, swelling, and secretion of the nasal mucosa. Many hay fever cases are susceptible to different stimuli, such as mimosa, horse chestnut, tobacco plants, roses, emanations from animals such as horses and cats, as well as the typical cases due to grass pollen. Some of them are susceptible to several of these. In addition, typical hay fever may go on to typical asthma.

In the same way paroxysmal rhinorrhoea or vasomotor rhinitis may be caused by differences of temperature, change of posture such as getting up in the morning, and also occurs in hay fever and asthma cases.

The typical asthma case is in my experience more often than not associated with one of the above. Whatever the type, chronic bronchitis is very apt to follow. Why is this? Obviously because swelling and hypersecretion of the mucous membrane of the upper respiratory tract sooner or later allow of infection. In hay fever and vasomotor rhinitis there is at any rate intermittent congestion and obstruction of the nasal mucous membrane with consequent infection.

In these cases the chronic bronchitis, as in cases of primary nasal obstruction, may be and often is a descending infection. The frequent association of nasal polypi and asthma is well known, but it must not be thought that the presence of polypi is the primary cause of the asthma, or that the removal of polypi from the nose will necessarily cure or even alleviate the symptoms. Often the removal has no such effect. It is true that the mechanical effect of the polypi may determine the onset of an attack; we must look deeper for the cause. Polypi are an evidence of nasal infection most frequently of the ethmoidal cells and it is this infection of sinuses which follows on the nasal obstruction due to swelling of the mucous membrane of middle turbinals and septum, which produces the polypi and often a descending infection of the bronchi.

The removal of polypi may and often does improve asthma and bronchitis by allowing free drainage from the affected sinuses.

Others more skilled than myself are dealing with the question of infection and immunization of the upper respiratory tract, and I would only suggest the following clinical observations. If a patient coughs up sputum and this is cultured, an idea of the bacteriology of the bronchi may be obtained, but the picture may be obscured by mouth organisms, saprophytes, etc.

In my experience a post-nasal swab will often give the true organism responsible for the condition. In every case cultures should therefore be taken from the gums and post-nasal space, in addition to culture of the sputum. Often Pfeiffer's bacillus may be found in the latter which cannot be got or is obscured in a culture from the sputum.

Similarly a Friedländer infection may be shown by culture from this area uncomplicated by dust infections or casual organisms, which would be found in a culture from the anterior nares. These frequently have no significance in the production of the clinical condition.

In conclusion, I will briefly epitomize the main points on which I should like to lay stress.

1. Many if not the majority of cases of chronic bronchitis have their source of infection in the upper respiratory tract and are descending infections.

2. All cases of chronic bronchitis should have the nose and throat examined from this point of view.

3. Pathological conditions of the nose and throat should be treated.

4. Special attention should be directed to the treatment of nasal obstruction, nasal sepsis, and nasal sinus infections.

GENERAL DISCUSSION.

Dr. A. C. INMAN (London) said that in every case of chronic bronchitis the sputum must be examined as a routine for the presence of tubercle bacilli; also the possibility of a syphilitic infection must always be borne in mind. It was advisable to examine the blood as regards the Wassermann and Sigma tests (2 to 3 per cent. cases being positive in hospital practice). He said that from a bacteriological point of view the most important micro-organisms in chronic bronchitis were the streptococcus and the bacillus of Friedländer. In the former infection the treatment with vaccines is disappointing, in the latter very successful. A possible explanation of this might be found in Professor Dreyer's recent publication of the lipoidal content of the Gram-positive and Gram-negative microbes. The "defatting" of the streptococci, which were intensely Gram-positive, might lead to better results from antigenic treatment. Preventive inoculation should be carried out during periods free from catarrh.

Professor E. L. COLLIS (Cardiff) said that he had investigated records of morbidity and mortality in England and Wales from bronchitis among adults. As a result he found that this disease contributed so much to sickness and death as to make it *facile princeps* among diseases. It was probably responsible annually for 80,000 years of invalidity, and accounted for some 28,000 deaths at ages of 15 and over. The mortality particularly concerned late life, and was somewhat heavier for males than females. It had been falling rapidly since 1870, and rather more for males than females. The fall had been greatest where the mortality formerly was highest—that was, in the lower grades of the industrial community. Statistics of mortality due to bronchitis presented the characteristics of a disease entity, varying independently of pneumonia and phthisis. They indicated that bronchitis was conduced to by severe climatic conditions, such as wintry weather and more particularly by atmospheric pollution. Industrial work influenced bronchitis less than pneumonia or phthisis; and evidence was lacking that aggregation of persons in industry, which represented opportunities for infection, influenced the prevalence of the disease; herein bronchitis differed from phthisis. Occupations which entailed exposure to atmospheric pollution, whether due to irritating gases or injurious dusts, carried with them risk of bronchitis. Generally mortality records suggested a chronic traumatic origin for the disease rather than an infectious origin. Reduction in morbidity and mortality from bronchitis might be expected to follow from (*a*) such social uplift as increased the health of lower grades of society, and from (*b*) smoke abatement in industrial districts and great towns.

Dr. FLORENCE STONEY (Bournemouth) drew attention to a very common cause of bronchitis in dental sepsis. This might frequently cause no local trouble and could only be detected by *x* rays; the dentist and the doctor could see the state of the apices without this help. Even one tooth with an abscess at the apex might be responsible for chronic bronchitis. A child aged 13, who had had bronchitis for six years, was completely cured by the *x* rays discovering a hidden apical abscess, which was removed, and the chest condition at once cleared up. Many cases of chronic bronchitis were left with their teeth in a very septic condition.

Dr. ASTON KEY (Southsea) discussed, from the standpoint of the general practitioner, the pathology of the condition, especially as regards the capacity for repair possessed by the damaged mucous membrane. It was this inability adequately to repair the damage which was their chief difficulty and which so often defeated their efforts, and on this account

pulmonary tuberculosis was often easier to cure than was chronic bronchitis. Emphasis had been laid, and rightly so, on the frequency with which nasal obstruction was a forerunner of bronchitis. It might also be said that if a series of cases were taken in which nasal obstruction existed or had existed prior to operation, a large number of them succumbed to bronchitis ultimately, in spite of all that had been done surgically.

Dr. G. B. BATTEN (Dulwich) mentioned his experiences as a general practitioner for thirty-seven years, and stated that the gradual weaning of chronic bronchitics from stuffy rooms and overclothing to fresh air habits and rational clothing had practically prevented cases of habitual chronic bronchitis from occurring. This line of treatment was of more importance even than the undoubtedly valuable treatment by vaccines or surgical procedures in the upper air passages.

Sir THOMAS HORDER (London) said that he had been prepared to expand in greater detail Dr. Perkins's reference to certain general or constitutional factors present in many cases of chronic bronchitis, but Dr. Hyla Greves had done so in some measure. It was a question, he thought, if the infective element had not been stressed too much of late years in this disease. Dr. Inman's experience of vaccine treatment confirmed that idea, and the speaker's experience was very similar. No pains should be spared to assess the nutritive, circulatory, metabolic, and nervous factors in these cases. To rely entirely upon a vaccine, which was not seldom done nowadays, was courting failure. He would like to raise another question: Was there no such thing as a "mucous diathesis"? Whether the mucous factor were regarded as an expression of a response to subinfection or not was really a quibble; it was certain that this factor differed enormously in different subjects. And the difference was quite likely to depend upon one or more of those general factors already mentioned. He drew an analogy between certain cases of bronchial catarrh and cases of mucous colitis. Not rarely both of these conditions occurred in the same patient. They had dropped the term "bronchial catarrh" of late, and they tended to speak of all cases as "bronchitis." He doubted the wisdom of this change in nomenclature, since he considered that the term "bronchial catarrh" had a definite connotation. There was, he thought, every transition between a true (infective) bronchitis and the bronchial mucous secretion of spasmodic asthma.

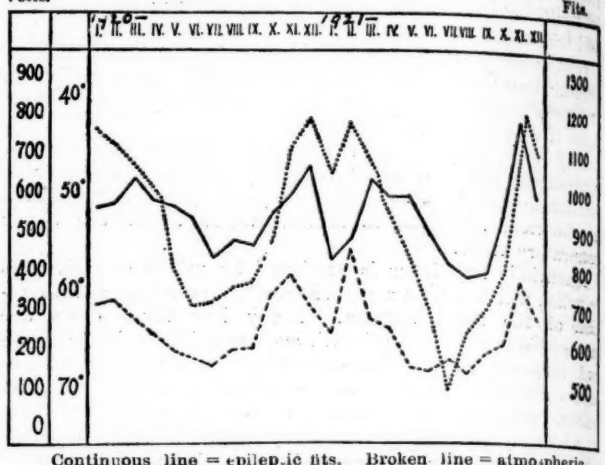
Dr. DONALD HALL (Brighton) said that he recalled a discussion on vaccines at the Royal Society of Medicine many years ago, at which it was said it was hopeless to attempt to treat *Bacillus coli* infections or chronic bronchitis with vaccine. In his own practice he had found autogenous vaccine of value in chronic bronchitis, and had had a very mixed experience of the results of operative treatment of the upper respiratory tract.

Dr. J. J. PERKINS, in reply, said that he was satisfied on the whole with the result of the discussion. Speakers appeared to regard chronic bronchitis in the main as a secondary or symptomatic condition. All were agreed on the importance of educating people to an open-air life in any part of this country, to the necessity for removing underlying conditions, and to building up the patient.

THE RELATIONSHIP BETWEEN ATMOSPHERIC ELECTRICITY AND EPILEPTIC FITS.

(Abstract.)

MR. GEORGE MAHOMED (Bournemouth) displayed some charts showing the relation between variations in atmospheric electricity and the incidence of fits among epileptics. Dr. Tylor Fox, of Lingfield Epileptic Colony, had furnished him with the details of fits occurring daily among the patients for two years. A chart showed these for the whole of 1921. On the same chart was the daily range of atmospheric potential. It was seen that there was a similarity, especially a seasonal one. In the spring and autumn both fits and potential were generally above the mean for the year; and in the summer months both were well below the average. Mr. Mahomed thought it might be expected that when the electric condition was high fits might be more numerous; but many would think that an epileptic was bound to have fits, and that their number would not be lessened by a low potential; yet it was evident that in the mass they were less frequent with a low potential. He also showed charts for both 1920 and 1921, where the monthly averages of both fits and potential were compared, and the parallelism was very obvious. Thinking that other meteorological factors might show a relation, he took temperature; the fits might vary inversely with the temperature. He prepared a chart of the inverted monthly temperature. There was some correspondence, but not so close as when compared with the mean atmospheric potential. The depression was more steep to the summer months, and the lowest point of fits was not the lowest point of temperature, which were in different months in both years; whereas with the potential they were in identical months. He thought the interdependence was incontrovertible, and it opened up a new field of inquiry, not only in regard to epilepsy, but towards numerous other nervous manifestations—for example, asthma, neurasthenia, psychoneuroses, etc. It enhanced the value of the climatological factor, and he regretted the inadequacy of our observatories in this respect. There was only one observation station for electrical variations in England (at Kew) and one in Scotland (at Eskdalemuir).



Continuous line = epileptic fits. Broken line = atmospheric electricity. Dotted line = temperature (curve inverted). Roman figures = months (1920-21).

SECTION OF NAVAL AND MILITARY HYGIENE.

Surgeon Rear-Admiral Sir PERCY WILLIAM BASSETT-SMITH, K.C.B., C.M.G., F.R.C.S., R.N.(ret.), President.

OBSERVATIONS ON THE LIFE-HISTORY AND BIONOMICS OF PHLEBOTOMUS PAPATASII.*

BY

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(Members of the R.A.F. Sandfly Fever Commission.)

(Abstract.)

PREVIOUSLY it was not understood how the virus of phlebotomus fever was carried over the winter months, as the imagines of the phlebotomus do not live through the winter, and as Doerr[1] and Birt[2] claimed to have shown that the blood of man only contains the virus during the first forty-eight hours of the fever. This latter point is doubtful, otherwise how are relapses to be explained? Relapses

* These observations form part of the researches carried out at Malta by the R.A.F. Sandfly Fever Commission, during the years 1921, 1922, and 1923. The Commission consisted of: in 1921, Squadron Leader H. E. Whittingham, Corporal G. H. Noakes, and Aircraftsman R. Stewart; in 1922, Squadron Leader H. E. Whittingham, Flight Lieutenant A. F. Rook, Corporal R. Stewart, and Aircraftsman H. A. Collett; in 1923, Wing Commander H. E. Whittingham, Corporal R. Stewart, and Leading Aircraftsman H. A. Collett, all of the Royal Air Force Medical Service.

certainly occur as long as forty-six days after the initial attack of fever.[3] Recently the R.A.F. Sandfly Fever Commission has shown that the virus of the disease is handed on from generation to generation of *Phlebotomus papatasii*.[4] The fever was transmitted to man by the bites of phlebotomi bred in sterile soil in England. Further experiments are in progress to endeavour to determine whether the phlebotomus inherits the virus, or whether the larvae infect themselves in the breeding grounds by eating the excreta or the dead bodies of the parent flies. But until evidence is forthcoming on this point there are two facts that should be clearly grasped:

(1) That *Phlebotomus papatasii* is the true carrier of phlebotomus fever.

(2) That the infection of the phlebotomus takes place in the breeding grounds.

Therefore it is essential that we should have a sound knowledge of the life-history and bionomics of this insect.

Phlebotomus papatasii is a small midge measuring about 3 mm. in length (Plate II, Figs. 13 and 14). It is of a very delicate build and thickly covered with fine, long hairs. The body is of a pale lemon tint. The eyes are relatively large, black, and conspicuous. The antennae are long, filiform, and consist of sixteen segments. The proboscis is long and contains delicate piercing organs; on either side the bushy labial palps are folded back on themselves to protect the proboscis. The wings are lanceolate, covered with fine hairs, and possess characteristic venation; they are always held erect, except when newly hatched and shortly before death. The female fly has a spindle-shaped abdomen (Fig. 14), while the external genitalia of the male are large and give the posterior extremity of the abdomen the appearance of the tail of an aeroplane (Fig. 13). The insect is readily recognized by its small size, erect wings, and short hopping flight. It is common in the littoral of the subtropical regions of Europe, Asia, and Africa.

In the past, numerous attempts have been made to breed the phlebotomus in captivity. Grassi,[5] Howlett,[6] Marett,[7 8] Newstead,[9] King,[10] and Waterston[11] have accomplished part of the life-cycle. Some eggs have been hatched and the developing larvae kept alive for over sixty days, but none of these larvae pupated, whereas other larvae found in nature have pupated and eventually imagines have hatched out from these. However, in 1922[12] the whole life-cycle was observed, and now several hundreds of phlebotomi have been bred in captivity in Petri dishes, test tubes, and specially constructed cages. This success was only obtained by a close study of the natural habits and habitats of the fly, each observation being confirmed by experiment. Special attention was paid to the food supply and to various meteorological conditions, including the daily maximum and minimum atmospheric temperature, humidity, and the earth temperature (4-foot tube).

Space does not permit of more than a brief résumé of the life-history of the phlebotomus as it occurs in Malta. The complete life-cycle of *Phlebotomus papatasii* in summer covers a period of about eight weeks, the exact time depending on food supply, temperature, and humidity. The ovum stage lasts about nine days; the larval stage about twenty-eight days; the pupal stage about ten days; and the imago stage about fourteen days.

THE OVUM. (Plate I, Figs. 1 to 6.)

The ovum measures 0.385 mm. in length by 0.12 mm. in breadth, is ovoid in outline, being convex dorsally and flattened or slightly concave ventrally. Its surface is moist, glistening, and of a pale yellow colour when first expelled. By trans-illumination the fatty globules in its interior can be seen (Fig. 1). Within twenty-four hours the egg-shell becomes opaque and the colour darkens to a light brown. Daily for eight days the colour darkens, passing from light to dark brown, and then to sepia. At the same time surface markings appear. These are dark, granular, longitudinal ridges running from pole to pole of the egg, and intersected at intervals by short cross ridges (Fig. 2).

Maturation of the egg, in summer, occurs in nine to ten days. On the ninth day the transverse markings of the embryo are visible through the distended egg-shell. Later in the day the caudal bristles can be seen as two distinct black lines running from one pole to the other of the egg, usually on the ventral surface (Fig. 3). Presently, a slow side-to-side rolling motion of the egg is seen, and within two hours the shell is ruptured in the dorso-anterior region by the action of the egg-tooth. If the atmospheric conditions are favourable the young larva has completely emerged within five minutes of the first appearance of the head through the egg-shell. An excess of moisture will retard the process for hours, or even cause the death of the insect. The effect of drying is more injurious than too much moisture. Drying for a few minutes is fatal. A humid atmosphere (80-90 per cent. humidity) without a surface film of water is the optimum condition. In nature the ova usually hatch out between midnight and dawn. A typical example may be given.

An egg, observed on August 6th, 1922, showed the transverse markings of the embryo and the caudal bristles distinctly through its ventral surface. Except for a slight side-to-side rolling movement, the appearance of the egg did not change until 3 a.m. on August 7th. Then a small fracture occurred on the dorsum of the anterior end of the egg, and within the next ten minutes a distinct bulging of the egg-shell was seen on the ventral surface. This bulging was due to air collecting between the embryo and the egg-shell. The distension of the egg-shell caused a temporary obliteration of some of the surface striations. Between 3 and 3.35 a.m. the fracture of the shell gradually extended in an oblique direction towards the posterior pole. At 3.35 a.m. the head of the larva was seen projecting between the torn gaping edges of the anterior pole. The larva now commenced to crawl out; first of all by a stretching movement of its body—the larva being slightly greater in length than the egg-shell which had contained it. The head was born in this manner, and the rest of the body was gradually extracted from the egg-shell by a wriggling, caterpillar-like motion, aided from time to time by pressure of the mouth of the larva against the surface on which the egg was lying. The last part to be born was the caudal bristles. The time taken for the larva to completely emerge was only two and a half minutes from the first appearance of the head (Figs. 4, 5, and 6).

THE LARVA. (Plate I, Figs. 6 to 10.)

The whole larva appeared white, moist, and glistening, except for the brown mouth parts and egg-tooth, and the black shining caudal bristles. These caudal bristles were bent up in the egg and lay along the ventral surface of the larva. After the emergence the larva lay still for a few minutes, then started to move very slowly, its speed being about 1 mm. in two minutes. It soon remained still again until its body had dried and hardened somewhat. Stippling marks were visible on its head; these gradually increased in size and became darker in colour, passing through various shades of grey, and eventually becoming black, except for a white Y-shaped area in the dorsum. Twenty-five minutes after birth the larva had crawled on the top of some insect débris, and the caudal bristles were sufficiently dry to be raised to an angle of about 45 degrees (Fig. 7). An hour after birth the head was almost black and the creature had become more active, the rate of progress being 1 mm. in fifty-eight seconds. An hour and a half after birth the head was jet black, except for the white Y-shaped mark, and the insect had commenced to feed on soft earth. Throughout the following hour it continued to feed greedily and a considerable amount of brown earthy material could be seen in the gut.

The larva consists of a head and twelve body segments. There are no eyes. The head is furnished with strong jaws, consisting of two mandibles dorsally and a single ventral labial plate. On the dorsum of the head, throughout all stages of the larva, is a conspicuous white, Y-shaped mark, and a pair of small conical antennae. Short white or yellow hairs, depending on the stage of development of the larva, are present on the head and body. On the body they are arranged in rings around each body segment—eight to each segment. The striking feature of these larvae is the presence of long, black, shining caudal bristles arising from the end of the last body segment; these are two in number in the first stage, and four in the succeeding stages of larval life.

For the first five days of life the larva feeds voraciously and increases rapidly in size. On the sixth day the gut is emptied of the contents and the larva becomes sluggish, frequently lying motionless on a piece of earth or insect débris. The body is of a creamy white colour, bloated, dull, and wax-like. At times the little creature looks dead. This death-like condition is most marked when there is a thin film of water around the larva. As the moisture becomes less the larva raises its head every now and again. For several minutes the anterior end of the larva may be held erect, like a cobra preparing to strike. Suddenly the larva taps its head sharply on the ground many times. A period of quiescence follows, lasting perhaps half an hour. This process is repeated again and again for eight to twelve hours, the time depending on the amount of moisture present—an excess of moisture retards the process. This is the end of the first stage or instar of larval life, the insect now being ready for the first moult.

Tabular Statement of Obvious Points of Difference in the Four Stages of the Life-cycle of the Larva of Phlebotomus papatasii.

Instar.	Days of Larval Life.	Characters which Alter throughout each Instar.				Characters which Remain Constant throughout each Instar.					
		Length of Body including Head.		Width of Body.		Width of Head.	Length of Body Hairs.	Colour of Body Hairs.	Pairs of Caudal Bristles.	Length of Caudal Bristles	Pigmentation of Dorsum of Posterior Segments of Body.
		Beginning of Instar.	End of Instar.	Beginning of Instar.	End of Instar.					Inner Pair.	Outer Pair.	
		mm.	mm.	mm.	mm.	mm.	mm.			mm.	mm.	
First	1 to 7	0.46	1.06	0.09	0.15	0.09	0.02	White	1	0.60	—	Termination of last segment.
Second	7 to 12	1.06	1.68	0.17	0.22	0.13	0.04	White	2	0.52	0.30	Distal quarter of last segment.
Third	12 to 17	1.70	2.50	0.24	0.33	0.15	0.08	Yellow	2	0.76	0.45	Whole of last segment.
Fourth	17 to 26	2.55	3.78	0.36	0.52	0.22	0.16	Yellow	2	1.06	0.75	Last segment and central part of penultimate segment.

The First Moult.

When the creature is fully ready to moult, usually on the seventh day of larval life, the body markings are indistinct and the body hairs appear blurred and duplicated, like outlines in a negative which has been slightly moved during exposure. This appearance is due to a separation of a portion of the chitinous head from the rest of the larval skin, by means of which some air enters between the skin to be cast and the new skin. The new body hairs lie between the two skins; the skin to be cast is so delicate that the hairs can be seen through it. At this stage the larva becomes more active and frequently taps the ground with its head—the portion of the head to strike the ground being in the region of the mouth. The chitinous head-cover becomes loose and quivers as the head sways from side to side. Eventually, one relatively severe tap causes the chitinous covering of the head to roll off like a mask, or else fall down and be held to the anterior and ventral portion of the larval skin as if by a hinge. The rupture of the larval skin takes place on the dorsal surface at the junction of the head and body. With the removal of the chitinous head-covering, the head of the emerging second-stage larva is displayed. The head is pearly white, except for the mouth parts at the anterior extremity, which are yellowish-brown. Gradually the larva withdraws itself from the old skin; the caudal bristles and ventral body hairs help to anchor the old skin to the surface on which it is lying. The larva gradually emerges by the combination of such actions as the raising of its anterior end, wriggling from side to side, arching of the body, and levering with its head against the ground. In some cases the discarded larval skin remains intact with the black chitinous head-cover attached to the thin, delicate body skin; in other cases the head-covering is completely separated from the rest of the shed larval skin, the two being some little distance apart. Twelve minutes is the average time taken for the complete emergence of the larva after the head-cover has separated. The last portion to emerge is naturally the caudal bristles, and during the moult they can be detected through the shedding skin. Not only are these bristles present at the time of moulting, but they are black and have attained their maximum length for the second instar of larval life. There are now four bristles, arranged in two pairs, the outer pair being about two-thirds the length of the inner pair. In some instances the caudal bristles are straight when the creature emerges from the cast; in others they are coiled round the posterior extremity of the body in the fashion of a pigtail. In the latter case the bristles straighten out during the next two to three days.

(*Note.*—Each larva was kept in a separate Petri capsule, and it was noted that those larvae which possessed coiled caudal bristles after moulting showed the same characteristics in future moults, and on the emergence of the imago the sex was found to be male in the three cases under observation. Too few observations were made to establish, or otherwise, any relation between the characters of the caudal bristles and the sex.)

The Second Instar. (Plate I, Fig. 8.)

Immediately after the moult the larva appears pearly white, moist, and glistening, except for the yellowish-brown mouth parts and black caudal bristles. It measures about 1.06 mm. in length and 0.17 mm. in width; these measurements increase daily during the instar. The determination of each particular instar is accomplished by measurements of the size of the head, length of the body hairs and caudal bristles, which remain constant throughout that instar.

The hardening and darkening of the chitinous parts of the larva in this instar take place in a manner similar to that which occurs after the larva has emerged from the egg. Within two hours of moulting the mouth parts are sufficiently hardened for the insect to feed voraciously on organic débris, especially on the remains of insects, whereas the first stage larva prefers soft earth. Frequently in the search for food the larvae mount on top of or get inside the chitinous remains of dead insects. The addition of a thin film of water causes many larvae to leave their hiding place and come out into the open—a certain degree of moisture increases their activity, while excess of moisture retards it. The quickest rate of progression a larva is capable of making is 1 mm. in five seconds.

Without repeating the description of the process of moulting and subsequent growth, it is enough to state that, in all, the larva passes through four instars of about six days each, and four moults, during which there is not only increase in size but developmental changes characterizing each period (see tabular statement). The average length of larval life is twenty-six days in summer, and in that time the larva grows to eight times its original size—that is, from 0.46 mm. on the first day to 3.78 mm. in length on the last day of larval life. The insect passes the winter months in the fourth larval stage and is fairly resistant to drying and moisture.

The first instar lasts about seven days; the characteristic features are a single pair of caudal bristles and the presence of an egg-tooth on the dorsum of the head, just anterior to the neck (Plate I, Fig. 7).

The second instar occupies the seventh to twelfth days of larval life and is characterized by the possession of two pairs of caudal bristles and a brown pigmentation of the dorsum of the distal quarter of the last segment of the body (Plate I, Fig. 8).

The third instar lasts from the twelfth to seventeenth days of larval life. This stage has two pairs of caudal bristles, but can be distinguished from the second stage by the brown pigmentation of the whole of the dorsum of the last segment of the body and by the yellow coloration of the body hairs (Plate I, Fig. 9).

The fourth and last instar lasts from the seventeenth to twenty-sixth days and is easily recognized by the relatively large size of the larva, and the dark brown pigmentation of the whole dorsum of the last body segment and the central portion of the penultimate segment. The body hairs are long and of a dark yellow colour (Plate I, Fig. 10).

There is a moult between each instar, and with the conclusion of the fourth moult pupation occurs.

Pupation.

The duration of time between the hatching of the ovum and pupation may be as short as twenty-four days or as long as 202 days. The latter figure refers to hibernation. The insect hibernates in the fourth larval stage.

The larva gradually empties its gut for two to three days before pupation. An excess of moisture or an earth temperature below 65° F. retards pupation. When about to pupate the larva seeks a drier spot—the under surface of a stone forms an ideal situation. The surface of the body appears distinctly bloated, dull, wax-like, and semi-transparent. The creature becomes very sluggish. It may lie for half an hour with its head raised like a cobra preparing to strike. Now and again it taps its head against the surface on which it is resting. During the twenty-four hours preceding pupation the three anterior body segments of the larva become more distended than the rest, the third segment being the broadest. Eventually, after numerous slow arching movements of the head and anterior portion of the body, the chitinous head-covering separates on the dorsum from the rest of the skin. Through this rupture the pupa gradually emerges by an arching backwards of its body and by wriggling to-and-fro movements in the air. The cast-off larval skin thus becomes crumpled up and collects around the three terminal segments of the pupa like a wrinkled stocking. The actual emergence of the pupa, in nature, usually occurs at night, and takes about eight to fifteen minutes.

PLATE I.

(Figs. 1 to 5 are magnified 80 times *circa*; Figs. 6 to 10, 40 times *circa*.)

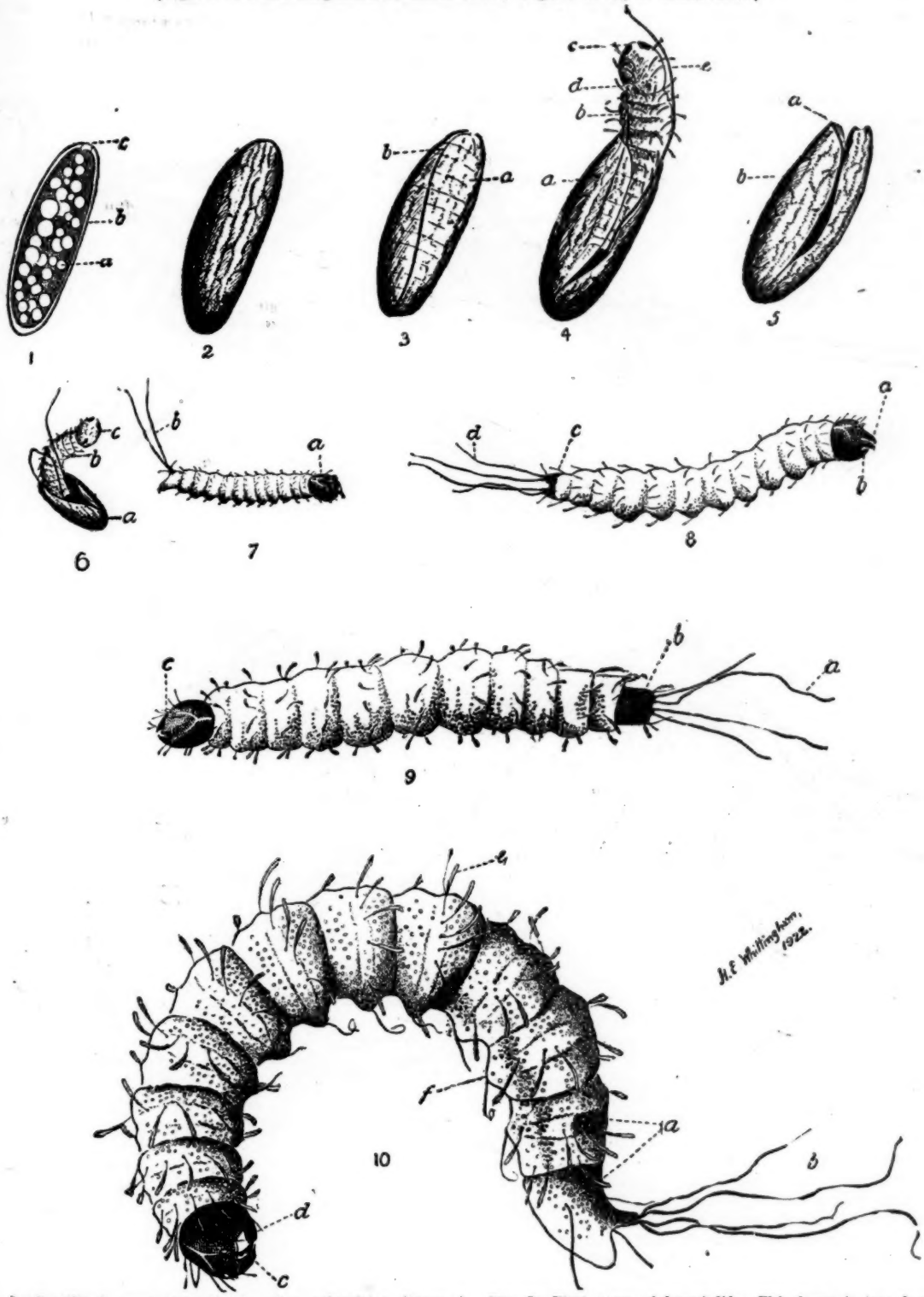

FIG. 1.—Fertilized ovum immediately after oviposition (transmitted light). *a*, Fat globules; *b*, egg-shell; *c*, micropyle through which sperm gains entrance to fertilize the ovum.

FIG. 2.—Fertilized ovum seven days after oviposition. Note the flattened (ventral) surface, and the convex (dorsal) surface, also the striations or sculpturings of the egg-shell.

FIG. 3.—Fertilized ovum nine days after oviposition. *a*, Segmentation of embryo; *b*, caudal bristle seen shining through the thin distended egg-shell. Some of the surface striations of the shell are obliterated by the distension.

FIG. 4.—Fertilized ovum nine days after oviposition. *a*, Ruptured egg-shell; *b*, larva in the process of emerging; *c*, mandibles; *d*, egg-tooth; *e*, caudal bristles. The emerging larva is pearl white except for the brown pigmentation of mandibles, labial plate, and egg-tooth, and the black caudal bristles.

FIG. 5.—Ruptured and emptied egg-shell of *Phlebotomus papatasii*. The larva has completely emerged. *a*, Rupture of shell extending from anterior almost to posterior pole; *b*, striations of shell.

FIG. 6.—Larva emerging from egg-shell. *a*, Shell; *b*, larva; *c*, head of larva. The larva is depicted undergoing wriggling, caterpillar-like motions.

FIG. 7.—First stage of larval life. This larva is two days old. *a*, Black head showing Y-shaped mark and egg-tooth within Y-shaped mark; *b*, single pair of caudal bristles. Note the twelve body segments.

FIG. 8.—Second stage of larval life. This larva is seven days old; the first moult had taken place the previous day. *a*, Mandibles; *b*, labial plate; *c*, pigmentation of dorsum of distal end of last abdominal segment; *d*, two pairs of caudal bristles.

FIG. 9.—Third stage of larval life. This larva is thirteen days old; the second moult had taken place on the twelfth day. In this stage there are two pairs of caudal bristles (*a*), and pigmentation of the whole dorsum of last segment of body (*b*). This is a dorsal view of the larva. The minute antennae (*c*) are seen just in front of the Y-shaped mark.

FIG. 10.—Fourth and last stage of larval life. This larva is twenty-two days old and is shown in a typical attitude adopted for a few days prior to passing into the pupal stage. In this stage there is pigmentation of the dorsum of the penultimate and last segments of the body (*a*), and two pairs of large caudal bristles (*b*). Note mandibles (*c*); labial plate (*d*); body hairs (*e*); and false legs (*f*). The false legs are distinct on all the body segments, except the first three.

PLATE II.

(Figs. 11 to 14 are magnified 20 times *circa*.)

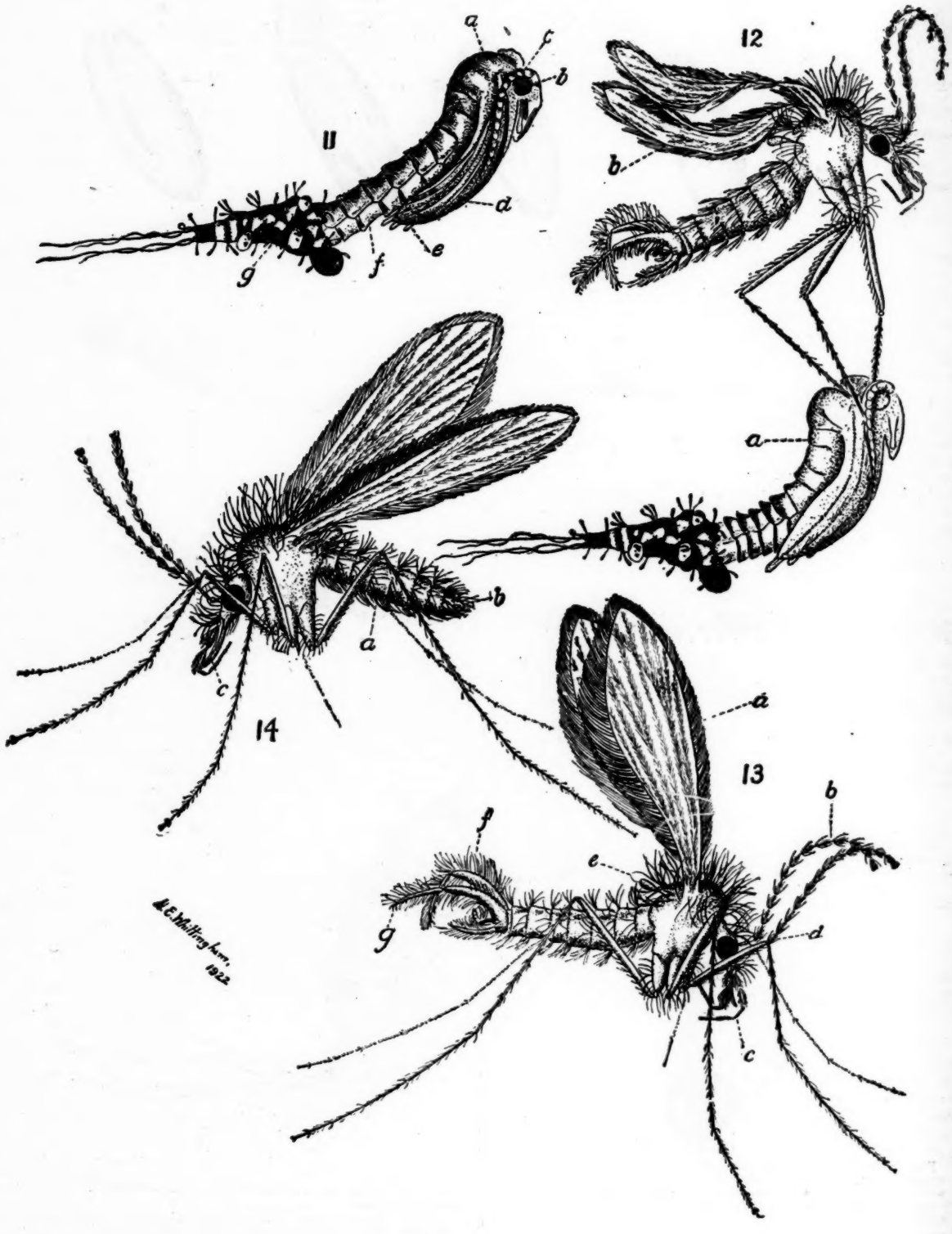

FIG. 11.—Pupa in seventh day of pupal life. *a*, Cephalo-thorax; *b*, eye; *c*, antenna case; *d*, wing sheath; *e*, leg sheaths; *f*, abdominal segments; *g*, remains of larval skin around tail of pupa.

FIG. 12.—Emergence of imago from pupa case on the tenth day of pupal life. *a*, Pupa case; *b*, crumpled up and horizontally posed wings of imago. In this stage the insect can only crawl, and the recognition of this fact helps in the detection of the breeding grounds of the phlebotomus.

FIG. 13.—Fully developed male imago. *a*, Erect hairy wings; *b*, antennae; *c*, labial palps; *d*, conspicuous black eye; *e*, halteres; *f*, claspers; *g*, genital spines which aid in the recognition of the species of phlebotomus.

FIG. 14.—Fully developed female imago. Note that the body hairs are arranged in tufts and the abdomen (*a*) is spindle-shaped; ovipositors (*b*); proboscis (*c*).

THE PUPA. (Plate II, Fig. 11.)

The newly emerged pupa measures about 3 mm. in length, is roughly club-shaped in outline, moist, glistening, and of a milk-white colour. The head and thorax appear fused in one mass which forms the head of the club. The handle of the club is represented by the abdomen, which tapers somewhat towards the posterior extremity. The outlines of the abdominal segments are seen as distinct ridges; only seven of the ten segments are visible, as the three terminal are enveloped by the remains of the fourth larval skin. The antennae are seen as curved ridges, one on either side of the cephalo-thoracic mass. The eyes are not visible at first, but after a few hours they appear as clusters of faint red dots, just below the curve of the antennae. These dots become more distinct and alter in colour almost daily; they change in colour from light to dark red, brown, and finally become black. Moreover, the various parts of the pupa become more distinct daily. By the ninth day of pupal life the component parts of the imago can be clearly recognized, and pigmentation of the eyes and hairs is pronounced. The imago is now preparing to emerge from the pupal case.

Emergence of the Imago. (Plate II, Fig. 12.)

Here again this further step in the life-cycle of the phlebotomus takes place between sunset and dawn; usually between midnight and 4 a.m., when the atmospheric humidity is between 80 and 90 per cent. The pupa periodically, with a flicking motion, bends its body backwards and forwards, the posterior end remaining fixed to the surface on which it lies. The pupa is of a pale silver grey colour. During the next two hours the dorsal curvature which was previously present disappears as the pupa stretches out in its length. Suddenly a rupture of the pupal case occurs at the cephalo-thoracic junction, and the delicate white hairs which cover the thorax of the imago project through. The head is the first part born, then the antennae, one wing, abdomen, the other wing, and finally the legs. The insect works itself from side to side to get the various parts free, the whole process lasting about ten minutes.

THE IMAGO.

The newly hatched imago is snowy white, except for the black piercing eyes. The body and wings are densely covered with long downy hairs. The wings are moist, crumpled up, and held horizontally over the body. They do not dry and unfold until the atmospheric humidity decreases; this usually occurs within three hours after dawn. When the wings are dry they are raised at an angle of 45 degrees above the body, and the insect is able to fly. By this time the mouth parts are hardened and the creature is ready to feed (Plate II, Figs. 13 and 14).

The Act of Feeding.

Only the female phlebotomus bites. A feed of blood is absolutely essential for the eggs to become fertilized. If flies of both sexes are caged together, but are fed on earth and organic débris only, they never become pregnant; whereas those which are fed on blood become pregnant. The phlebotomus usually bites after sunset, unless strong winds have been blowing for a few days. In the latter case they are held captive in their breeding haunts, and hunger causes them to seek a feed of blood at the earliest opportunity, night or day. Man is bitten wherever the skin is exposed, even through a thin sock.

The phlebotomus alights with wings erect and body parallel to, but raised off, the skin on which it rests. The legs are gradually spread out so as to bring the point of the proboscis close to the skin; at the same time the labial palps are raised upwards and outwards; apparently the fly is sensing a vein, for it always pierces one with great precision. In this attitude it may make short runs over the skin, but at last a suitable site is found. The fly steadies itself, then quickly lowers its body by a sudden spreading out of its legs; there is very little tilting forward of the body, if any. The palps are widely separated laterally and the proboscis is inserted into the skin for half to two-thirds its length. The actual bite is not felt, the pricking sensation is caused by the injection of saliva which takes place a few seconds later. This saliva delays the clotting of the blood. The blood is soon sucked up; within ten seconds it appears in the stomach. At the end of two and a half minutes this organ is so distended that it practically fills the whole abdomen. The abdomen is bent downwards so that the posterior end almost touches the skin surface. The proboscis is withdrawn and the insect flies away to a low part of the room. Complete digestion of the meal takes five days in a pregnant, longer in a non-pregnant, fly.

Copulation.

Copulation usually does not occur until the second day of adult life. In the majority of cases (96 per cent.) the female has had a feed of blood prior to the act. The female feeds on the first day of life, and it is about twenty-four hours later before the process of digestion has lightened the abdomen sufficiently for the posterior end to be raised off the ground. The somewhat lightened female mounts to the higher parts of the room, for it is here the males congregate. Phlebotomi, unless in copulation, are always found with their heads pointing upwards on a wall. The male phlebotomus approaches the female from behind and a little to one side, stands still, then energetically swings his abdomen from side to side as if judging the distance. Suddenly he swings round through half a circle and grasps the posterior extremity of the female with his powerful claspers. The act of copulation lasts about thirty minutes. One copulation is sufficient to fertilize the female.

The duration of pregnancy varies from seven to ten days; further feeds of blood may be partaken of, but are not necessary. Oviposition occurs about the ninth to tenth day of life and continues for two to three days, the fly usually dying in the process on the fourteenth day of adult life.

Process of Ovulation.

Oviposition takes place over a period of two to three days. If the fly partakes of a feed of blood when the ova are ready to be deposited the sudden increase of the intra-abdominal pressure causes the forcible extrusion of one or more eggs. The eggs may be ejected for a distance equal to that of the length of the fly (3 to 4 mm.). Usually the eggs are gently dropped just clear of the posterior extremity of the insect, singly at first with a period of half an hour to an hour between each. The following day the fly shows signs of exhaustion, the legs are spread out, the labial palps unfold, and the wings drop to the horizontal position. Now the contractions of the abdomen become very spasmodic, the posterior end is raised, the ovipositors widely opened, and the abdomen foreshortened. This contraction is shortly followed by a sudden dropping of the abdomen. After several such contractions those eggs which remained in the ovaries are discharged in a mass—perhaps fifteen to twenty eggs. Thereafter the fly dies exhausted.

The full complement of eggs in the ovaries is about forty. These are rarely all laid. The average number to expect from each female fly is about five—that is, after allowing for unsuitability of environment, sudden death, and non-pregnant condition of some flies. Of the eggs laid less than 50 per cent. reach maturity. These figures have been obtained from the results of repeated observations on thousands of flies.

A pregnant phlebotomus, when the ova are mature, must either deposit them or die egg-bound. If the atmospheric humidity is not fairly high (that is, above 65 per cent.) the fly does not oviposit. This fact has been established by keeping pregnant phlebotomi in test-tubes under various degrees of humidity. Granted the requisite amount of humidity the fly usually chooses certain situations, if obtainable. The favourite situation is some dark sheltered spot where there is nitrogenous organic matter and a moderate degree of moisture. Where soil is available the majority of the flies deposit their eggs underneath pieces of earth, stones, or insect remains. In such places the eggs are somewhat protected from dislodgement by air currents and heavy rains, and from the injurious effects of excess of moisture or undue evaporation. Phlebotomi frequently deposit their eggs in garden soil, and in the loose earth at the foot of walls and buildings. The latter is an excellent site, for much nitrogenous organic débris blown about by the wind gathers here, and the requisite moisture is obtained by the condensation of the atmospheric humidity on the walls. Loose earth, stones, and rubble of any sort provide breeding grounds, and flies have actually been found ovipositing on

clothing and mosquito nets during the damp summer weather (sirocco). Experiments have confirmed these observations.

Earthenware pots were lined and covered with sterilized butter-muslin. These were placed in soup plates containing water, so that the lower half-inch of the pot was immersed. The water saturated the butter-muslin lining at the bottom of the pot; above this level varying degrees of moisture were obtained, depending on absorption by the muslin. Moreover, by evaporation of the water a high degree of humidity was obtained in the air in the pot. Phlebotomi were introduced and allowed to lay their eggs. When all the flies were dead the lining was removed and examined with a lens: 30 per cent. of the eggs laid were found on the muslin in the first inch, 42 per cent. in the second inch, 19 per cent. in the third inch, and 7 per cent. in the fourth inch above the water-line. Or, expressed in another way, 81 per cent. of the eggs were laid in the area from 1 to 2¼ inches above the water-line.

In pots of similar construction, except that a plaster stand covered with some organic matter (earth and blood mixture, or insect remains) was placed in the bottom of the pot inside the muslin lining, most of the eggs were deposited in the organic matter; only 38 per cent. were found in the muslin.

These results show that a considerable degree of humidity is required for ovulation, and that the presence of nitrogenous organic matter creates a favourable soil.

It might be thought that those eggs that were laid on the muslin owing to the absence of nitrogenous organic matter would not mature. On the contrary, over 50 per cent. reached maturity in the normal time (nine to twelve days). Eggs laid in the second inch above the water-level hatched out first, then those in the upper part of the first inch, to be followed by those in the third inch, and in a few instances those in the fourth inch and lower part of the first inch. Many of the eggs that had been too dry or too moist failed to hatch. Most eggs will stand submersion for at least an hour, the result being a delay in maturation.

Movements.

The ovum is stationary, except for the rolling motion which precedes the hatching of the larva.

The larvae have a caterpillar-like motion. Their rate of progression varies with each stage of life and with the type of surface. The really active larvae are those in search of food, especially when in the last instar. The latter frequently attain a speed of 1 mm. in four seconds. The filamentous hairs and the sucker-like false legs on the under surface of the larvae give them a firm foothold. Various U-shaped and S-shaped attitudes are adopted by the larvae before and during each moult.

The pupa is fixed to some piece of earth, insect débris, or rock by the remains of the last larval skin. Now and again, from the action of such stimuli as changes of temperature and humidity, air currents, or chemicals, it moves the anterior part of its body. The movement consists of a series of quick backward and forward flicks, the body bending in the region of the fifth abdominal segment. These movements are most evident for a few hours before the imago emerges, but can take place from the earliest moment of pupal life.

The adult phlebotomus, when newly hatched, can only crawl. Later, when the wings are dry, it progresses by a short hopping flight usually to one side or other. The distance of a single flight is never more than four yards, and it does not travel more than fifty yards from its breeding haunts, probably less. This knowledge is important in connexion with prophylaxis.

The insect rests during the day and is active at night. It is attracted by the odours of man and other animals. Phlebotomi enter buildings by apertures in the walls—windows, doorways, ventilators, or even cracks. The females remain in the lower levels of the room in quest of blood, while the males collect near the ceiling to await the females for pairing purposes. The flight of the phlebotomus is so feeble that it avoids all currents of air, natural or artificial. There is a definite relationship between the force of the wind and the number of flies found indoors; roughly speaking, they are present in inverse proportion to the force of the wind. Upstair rooms, which are more exposed to air currents, are less infested with phlebotomi than those on the ground floor.[13]

Food Supply.

The young larva, for the first few days of its existence, prefers soft earthy material containing nitrogenous organic matter. Later it is frequently found to devour the softer parts of the remains of insects. It thrives on mixtures of earth and human or sheep's blood, earth and human faeces, lizard's faeces, and ground-up cockroaches. This food material must have a thin film of surface moisture. A considerable number of larvae breed in the earth at the foot of walls and buildings—situations where other insects and reptiles congregate and leave their faeces and dead remains. Moisture condenses on the walls at night, gravitates to their bases, and provides the necessary degree of humidity.

The adult fly, if of the male sex, feeds on any organic matter that it can suck up from the earth, vegetation, clothing, or even the sweat of man; it can exist for six days on water. The female phlebotomus can live on similar organic matter, but requires a feed of blood before she can become pregnant. The eggs of females fed on earth and organic débris only never become fertilized. *Phlebotomus papatasii* prefers the blood of warm-blooded animals; *Phlebotomus minutus* feeds chiefly on cold-blooded animals, but can feed on man.

Drying in the Shade.

The ova withstand drying in the air for a short time—about an hour.

The effect of drying on the larvae varies with their stage of development. When newly hatched the larvae, if allowed to dry, die almost immediately. Throughout the first and second instars the resistance to drying is not much greater, while the third and fourth stage larvae possess considerable powers of resistance. Such larvae have survived for three weeks without any addition of water to the shallow soil in which they lay, exposed to the air. These larvae eventually completed their life-cycle.

Pupa may be dried in the air for weeks and still retain their vitality.

The adult flies live longest, other things being equal, in a relatively dry atmosphere (40 to 50 per cent. humidity). The duration of life in such an atmosphere may be as long as thirty days, whereas in a moist atmosphere the flies rarely live longer than fourteen days.

Moisture.

The ova sink in water; submersion for twenty-four hours does not kill them, but delays their development. If left submerged for longer periods of time they do not mature. A fairly moist site is required for their healthy maturation. All stages of the larva sink in water after a few minutes. They do not withstand complete submersion for long, but partial submersion, such as would be experienced during the heavy rains, is endured for at least three consecutive days in the case of the larger larvae. The young larvae are less hardy.

The pupa does not withstand complete submersion in water for more than an hour. If kept covered with a thin surface film of water for three consecutive days it usually dies. Submersion in absolute alcohol took twenty minutes to kill one pupa.

Adult phlebotomi can live in a humid atmosphere, but, as has been stated, they prefer one which is relatively dry. These flies are killed almost immediately if water is sprayed on them; their wings are damaged, and probably also their delicate respiratory apparatus. Instinct apparently defends them, for they avoid skin that is bathed in perspiration, especially damp hairy parts.

Temperature.

The various stages of the life-cycle of the phlebotomus require an earth temperature (4-foot) of over 65° and under 80° F. for their healthy development. When the mean daily atmospheric temperature falls below 65° F. the adult fly cannot oviposit, but dies in a few days. An atmospheric temperature of over 90° F. is injurious to the adult. The optimum atmospheric temperature for all stages lies between 70° and 80° F. The insect hibernates in the fourth larval stage when the earth temperature falls below 65° F., and, as the shortest period of time in which the pupal state can be completed is nine days, the geographical distribution of the phlebotomus is restricted to places where the earth temperature (4-foot) is maintained above 65° F. for at least ten consecutive days.

It has been stated that the fall in the incidence of phlebotomi in July and August is due to the heat killing these flies; but this fall may be explained by the fact that during these months most of the summer brood are in the ovum, larval, or pupal stage. Thus the length of the life-cycle explains the two distinct waves in the incidence of the phlebotomus—the first in June, the second early in September.[13]

It is possible to prolong the larval stage considerably by the retarding effect of increased moisture or lower atmospheric temperature. In this manner several larvae have been kept in the fourth larval instar for six months, and then, by reducing the amount of moisture and incubating at 80° F., pupation has occurred. Adult phlebotomi eventually hatched out from these pupae.[14] This shows that *Phlebotomus papatasii* hibernates in the fourth larval stage—the stage which is best adapted to cope with the heavy rains and the cold of the winter months.

Habitats.

In nature the larval and pupal stages are found in the cracks of embankments, in the loose earth at the base of walls and buildings, in cultivated soil, and in other places where suitable conditions of food, moisture, and temperature exist. Larvae are found even to a depth of a foot or more in loose soil; they are freely mobile, and can migrate to the level of optimum environment. When ready to pupate they seek a drier spot, so that the pupae are usually found within a few inches of the surface of the ground.

Phlebotomus papatasii is directly responsible for the conveyance of phlebotomus fever to man. Prophylactic measures against this fever must be directed upon the fly. It is only by having a sound working knowledge of the life-history and bionomics of this insect that these measures can be applied successfully and economically.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE FIBULA AS A BONE GRAFT FOR UNUNITED FRACTURE OF THE NECK OF THE FEMUR.

A YOUNG adult male suffered a fracture of the neck of the left femur in a railway accident. After nine months, in spite of immobilization in a Thomas's hip splint and walking exercises in a calliper splint, there was no evidence of union. The usual causes of non-union of fractures in Egypt—syphilis, ankylostomiasis, and bilharziasis—could be eliminated.

At operation, under stovaine anaesthesia, the glutei muscles were reflected upwards by chiselling through the tip of the great trochanter. The joint was then exposed from above and the loose head of the femur secured by lion forceps. A hole was drilled, by an electric burr, through the base of the great trochanter and the neck of the femur into the cancellous tissue of the head of the bone. A length of the fibula, previously removed with its periosteum intact, was then driven through the hole into the head of the femur.

No splint apparatus was applied; but the patient was encouraged to move the quadriceps and, finally, to perform all the movements of his leg while lying in bed. The strength of the fibula was sufficient to give the necessary stability to the neck of the femur to allow of these movements. Radiographs taken at regular intervals showed new formation of bone and a progressive attenuation of the graft. At the end of two months, the muscles of the leg being in excellent condition, the patient was allowed to walk with a crutch. At the end of three months he was walking upstairs and down by progressive steps and without any support. The hip-joint allowed voluntary flexion to 45 degrees. There is shortening to the extent of one inch.

The conclusions to be drawn are: (1) That access to the hip-joint by this method of approach is easy. (2) That the loose head of the bone can be simply secured while the cancellous bone is being drilled. (3) That early and complete mobilization by voluntary movements without massage is valuable. (4) That new bone develops rapidly as a direct result of the presence of the graft and the trauma occasioned by the bone drill. (5) That stovaine anaesthesia almost completely eliminates surgical shock. (6) That this method of bone grafting is, as compared with others, relatively easy.

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INTESTINAL SPASM DUE TO ASCARIS LUMBRICOIDES.

I OPERATED recently upon a boy, aged 12, for appendicitis. After cutting through the abdominal wall and opening the peritoneal cavity I pulled up into the wound a piece of small intestine which presented an unusual appearance. The bowel appeared to be in a state of spasm, the free border forming a firm, hard, rounded cord about three-eighths of an inch in thickness; the rest of the walls were in accurate apposition. This condition was traced above and below for about ten inches in all, the "cord" tapering off at each end. The intestine immediately above and below was quite normal. The cord-like appearance was due to the wall of the bowel at its free border firmly embracing an *Ascaris lumbricoides*.

I record this case because such a phenomenon must have been rarely seen. Although we know that "worms" produce colicky pains and other dyspeptic and nervous symptoms, yet few can have realized that an *Ascaris lumbricoides* could give rise to a spasm causing a total though transient occlusion of so great an extent of the intestine. Surely this must mean some considerable functional disturbance, either directly or reflexly, of the digestive tract, and emphasizes the necessity, in the interests of the patient, of an early diagnosis and removal of these parasites.

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TWIN PREGNANCY IN A BICORNUATE UTERUS WITH CONTRACTED PELVIS: DELIVERY BY CAESAREAN SECTION.

A HINDU woman, aged 38, full-time pregnant, was admitted to hospital on April 6th, 1922, labour having begun twenty-four hours previously. She had had two previous labours: (1) the child died soon after birth; (2) a breech, in which there was difficulty with the after-coming head and the child was born dead.

On admission the patient's general condition was good; the abdomen was very large, and two foetuses could be distinctly felt. Per vaginam the os was found to be fully dilated, the membranes ruptured, and the breech of the first child presenting. The sacral promontory was within easy reach of the finger; after labour the true conjugate was estimated as 3 inches. As a living child was very much desired I decided on delivery by Caesarean section.

On opening the abdomen the appearance at first suggested a normal full-term uterus and a large tumour or cyst; this latter proved to be the second horn of a bicornuate uterus. The two horns appeared equal in size, and separation occurred about a handbreadth below the round ligament. The lower uterine segment was distended by the breech of the first child. A living male child was delivered from the left horn of the uterus and the incision closed before opening the right horn. On opening the latter the membranes were found unruptured, and a second living boy, also presenting by the breech, was delivered. The second incision was then closed.

The patient made an uneventful recovery, and she and both children were doing well when discharged from hospital at the end of three weeks.

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PRELIMINARY NOTE ON THE *X*-RAY TREATMENT OF INTERSTITIAL KERATITIS.

OUR interest in the treatment of interstitial keratitis by *x* rays was aroused by an article by Japiot and Bussy.[1] Several cases have now been treated for us by Dr. Oram, honorary radiologist to the David Lewis Northern Hospital, Liverpool. All attended St. Paul's Eye Hospital and received the usual treatment for interstitial keratitis during the course of *x*-ray therapy. The action of the rays has proved a beneficial adjunct to the usual treatment, and the response has been more noticeable in patients over the age of puberty. The results encourage us to make further use of this method of treatment. On the suggestion of one of us, other surgeons are now, we believe, trying this treatment. Three cases might be recorded here:

1. A man, aged 22, under the usual treatment to the right eye from February 13th to August 24th, 1923; he then went back to his work. On October 19th he reported again to St. Paul's with the left eye affected. From the first *x*-ray therapy was combined with the usual treatment, and after three *x*-ray treatments he returned to his work and expressed himself as delighted. There has been no relapse to date.
2. A girl aged 16, a typical and very severe case, after five treatments by *x* rays had no photophobia and was able to recognize her friends easily and considered herself "quite well."
3. A girl, aged 15, has had four *x*-ray treatments and has improved so rapidly that the mother voluntered the statement that no treatment previously received by the girl had made such a marked improvement in the condition.

Dr. Oram reports particulars of the dosage: Five minutes' exposure once weekly; 5-inch spark gap; 1 milliampère of current; 9 inches from the anticathode to the eye filtered through 1/2 mm. aluminium and two felts.

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[1] *Journ. de Radiol. et d'Electrol.*, March, 1921.

Reports of Societies.

INTRACRANIAL HAEMORRHAGE IN THE NEWBORN.

THE Medical Society of London held a discussion on "Intracranial haemorrhage in newborn children: its pathology, effects, treatment and results," on December 10th. The President, Dr. HERBERT SPENCER, occupied the chair.

Mr. EARDLEY HOLLAND, in opening the discussion, said that as an obstetrician he had been chiefly interested in the etiology and pathology of intracranial haemorrhage. He referred to the excellence and importance of Dr. Herbert Spencer's work[1] on visceral haemorrhages in stillborn children. He proceeded to give in outline an account of the mechanics of traumatic intracranial haemorrhage which he has so fully considered in his admirable report to the Ministry of Health.[2] His remarks were well illustrated by epidiascope reproductions of drawings and diagrams which have already been published in the same report. Cranial stress consisted of a general compression of the whole head, and a simple longitudinal compression by opposite forces acting at the ends of the long diameter of engagement of the head in the pelvis. The more rapidly these forces were applied the more serious was their result. Excessive stress led to an overstretching and tearing of the tentorium cerebelli and falx cerebri, and to the rupture of certain blood vessels. The commonest site for tears was in the tentorium at its junction with the falx. The changes in the septa were transmitted to the vein of Galen, which became stretched, kinked, and engorged; the consequent rupture of this vein or of its tributaries resulted in subdural haemorrhage of greater or less extent. Normally the septa exerted a protective function in labour, by preventing excessive alterations in the shape of the foetal head. With this object they contained special strengthening bands and fibres, beautifully arranged on mechanical principles along the lines where stress was likely to fall during moulding of the head. Antero-posterior compression of the head and the consequent vertical elongation were particularly dangerous, and application of forceps to the antero-posterior diameter always involved considerable risk. The risk of applying forceps to the extremely plastic head of a premature foetus was well known. In all cases of forceps delivery the degree of stress obviously depended on the amount of force exerted. In breech deliveries the high percentage of intracranial injuries was probably to be explained by the rapidity with which forces were frequently brought to bear on the structures concerned. A less common cause of intracranial haemorrhage was foetal asphyxia, which might lead to venous congestion. Pressure on the umbilical cord or separation of the placenta presumably gave rise to an accumulation of carbon dioxide in the foetal blood which stimulated respiratory movements. Such respiratory attempts on the part of the foetus would lead to a partial closure of the ductus arteriosus, and about half the blood in the right auricle would be dammed back; the lungs not being expanded, the circulation of this blood through them would be obstructed, and in consequence there would arise a most intense venous engorgement. Intracranial haemorrhages of this type were usually associated with multiple haemorrhages in other organs.

The actual sites of intracranial haematomata produced by one or other of these causes were of interest; but exact diagnosis was extremely difficult during life. They were not usually definitely circumscribed, indeed they were commonly multiple and diffuse. Operative treatment, for this and other reasons, was not hopeful. Lumbar puncture was only of temporary value.

Dr. H. C. CAMERON dealt with the after-history of such infants as survived. Obstetricians in this and other countries had demonstrated the frequency of intracranial haemorrhage in infants born dead or moribund, and it had

[1] *Trans. Obstet. Soc. of London*, 1892, vol. xxxiii, "On Visceral Haemorrhages in Stillborn Children."
[2] Reports on Public Health, No. 7, "The Causation of Foetal Death," by Eardley Holland. Ministry of Health, 1923.

been commonly believed that certain cases of cerebral diplegia represented some part of the survivors of this form of injury at birth. Little himself had advanced this view. Present-day neurologists, however, as represented by Collier, tended to regard cerebral diplegia as due to a primary error of development pre-natal in origin. It might be argued that intracranial haemorrhage was invariably fatal at or shortly after birth, but his (Dr. Cameron's) experience of infants and children had impressed upon him the essential soundness of Little's contention. The immediate signs of large subdural haematomata were well known. A day or two after birth the majority of cases showed retinal haemorrhages and oedema of the optic disc, and certain characteristic symptoms. The seriousness of the condition was most clearly indicated by impairment of two vital functions—sucking and breathing; the suction reflex was entirely absent. Attempts were being made to localize the sites of haemorrhage with a view to surgical relief. The obstetrician dealt only with the beginning of the story; the neurologist only with the end. For the intervening period reliance must be placed on the general practitioner and the pediatrician. The latter was usually called to see a newborn infant only when immediate death was feared or expected. A skilled investigation of any infant whose well-being gave rise to doubt was surely indicated by the observations of Mr. Holland. Prematurity or feebleness alone must not be regarded as a sufficient explanation of the failure to suck, of asphyxia, or of insomnolence. The nature of the labour was rarely indicative of the infantile lesion; the symptoms exhibited by the child itself had far greater significance. A history of constant screaming or of stupor, of aphonia, refusal to suck, rigidity, convulsions, asphyxia, facial or oculo-motor paresis or twitching, was extremely suggestive, but unfortunately, from want of early examination, rarely attainable. Observations on the colour of the stools were too frequently substituted for a routine physical investigation. A further difficulty was afforded by the long latent period which ensued after recovery from the immediate symptoms before the after-effects were commonly appreciated. Those parts of the brain which controlled complicated motor activity and equipoise of the body were not developed at birth, and, as these particularly were the areas affected in non-fatal cases of haemorrhage, the backwardness of the child was not generally recognized until a year or more had elapsed. The term "Little's syndrome" was properly applied to two groups of cases and to two only. First, to cases of paraplegic rigidity without mental defect and without convulsions; secondly, to cases of general rigidity usually without convulsions and without mental symptoms or with only that degree of backwardness which was accounted for by delay in the auto-education proceeding from grasp and touch. The treatment of the first group was generally orthopaedic, and no question of mental defect arose. It was only when the hands had become stiff, immobile, and anaesthetic that an appreciable delay in the mental development of the child resulted. When, in addition, the face was stiff and immobile, when speech was long impossible, and when the laugh and cry were expressionless and not charged with emotion, the stimulation of gross idiocy or imbecility was close. Yet these children were not idiotic; their backwardness was due to sense deprivation, the sense of touch. Their intelligence was always much greater than would appear from a cursory examination. The ultimate result, compared with the initial backwardness in achieving voluntary control of movement, was often surprisingly good. It was possible that neurological studies held to prove the negligible bearing of birth trauma on cerebral diplegia had been based on material derived from very different sources.

Dr. Cameron illustrated his graphic description by demonstrating a well marked case of general rigidity whose mental development he had been able to trace and follow.

Mr. LAMING EVANS gave an outline of the treatment and results of treatment from an orthopaedic point of view. He referred to the question which had been raised by previous speakers as to the origin of the spasticity, and regarded it as important to decide whether this was primarily due to intracranial haemorrhage or to a fundamental nervous lesion. He proceeded to describe the common deformities of the upper and lower extremities which were presented to the surgeon for treatment. Children were brought to him between the ages of 2 and 18. He stressed the value of accessories to purely surgical measures; it was essential to pay strict attention to hygiene, and especially to the general and physical education of the subject. Muscle education was a factor of first-class importance. In his experience electrical stimulation had proved useless in these cases. He described the merits and demerits of various appliances, and discussed operative procedures in some detail. Foerster's operation —the resection of posterior nerve roots—had now been generally abandoned in the treatment of this condition. In certain cases a plastic operation was advisable, and attention was directed chiefly to the muscles and tendons; in other cases the nervous system formed the centre of attack.

Mr. H. A. T. FAIRBANK considered the actual origin of the deformity to be immaterial so far as the orthopaedic surgeon was concerned. He regarded three years as the optimum age for operation. It was extremely desirable that the child should have been encouraged to make some attempt to walk and co-ordinate its movements beforehand. At a later age the condition naturally became more difficult to treat. There were several contraindications to operative measures. Education was invaluable. The nature of the operation varied; it was impossible to prescribe set operations to meet different types of case; each individual should be considered as a separate problem, and a surgical attack planned according to its particular features. The most satisfactory operation to correct the adductor deformity of the lower limbs was usually exsection of the obturator nerve.

Dr. L. G. PHILLIPS referred to necropsies made at Queen Charlotte's and St. Mary's Hospitals in a hundred cases of foetal death. In twenty of these intracranial haemorrhage had been found. Premature delivery was an important factor; apparently it multiplied the foetal risk in this respect by four. As a result of the observations it seemed clear that the induction of labour should not be undertaken before the thirty-fifth or thirty-sixth week of pregnancy, and that forceps should not be applied in the delivery of premature infants. Four of the cases of intracranial haemorrhage had occurred in cases of toxaemia of pregnancy. To explain these Dr. Phillips postulated a defect of the endothelium of the blood vessels; in his opinion a similar defect characterized and resulted from the toxaemias of pregnancy in general. The prevention of intracranial haemorrhage in the foetus was to be attained by prevention of ante-partum and intra-partum asphyxia and of the development of toxaemic conditions in pregnancy. Forceps deliveries should be reduced to a minimum.

The PRESIDENT congratulated the speakers on their investigations and the lucidity of their observations. He introduced certain points which had occurred to him in the course of his own researches. One potential factor in the production of intracranial haemorrhage in the foetus appeared to be a depression of the lower angle of the parietal bone in difficult labour; in obstructing one of the most important veins in the head this would lead to local engorgement and consequent haemorrhage. His original investigations had been directed towards the study of visceral haemorrhage in general, and, in spite of the particular subject of discussion, he felt justified in referring to a line of research which appeared to him to be of considerable interest and importance—namely, a study of the condition of the testes in cases of foetal death. This might have an important bearing on one aspect of the problems of sterility.

Mr. EARDLEY HOLLAND, in replying, referred to the main point raised by Dr. Cameron. He thought it inevitable that some children suffering from the milder degrees of intracranial haemorrhage should survive. Certain infants had lived for a week and had then been found *post mortem* to have had enormous haemorrhages. If these were not immediately fatal it was impossible to believe that lesser haematomata should be incompatible with a continued existence. He had been very interested to see the cast of an asymmetrical head which had been demonstrated by Dr. Cameron, and from previous experience judged that the abnormality had been accompanied by a tentorial tear.

Dr. CAMERON regretted the absence of the neurologists. He had been particularly anxious to hear their views as to the etiology and pathology of the types of case he had described.

THE VALUE OF COCAINE SUBSTITUTES.

A COMBINED discussion on "The value of cocaine substitutes," in which several Sections participated, was held at the Royal Society of Medicine on December 7th. The chair was taken by Mr. H. J. BANKS-DAVIS (President of the Section of Laryngology), who mentioned that although the discussion was under the auspices of the Society, the idea of it originated with the Ministry of Health in connexion with the official inquiry into the subject now proceeding.

Laryngology.

Dr. P. WATSON-WILLIAMS said that the quest for cocaine substitutes had been fruitful, but while some were of great value and had already displaced cocaine in certain departments, the majority were of quite ephemeral repute. The two essentials of the ideal local anaesthetic to be considered were anaesthetic efficiency and safety in clinical dosage, but it should also be devoid of temptation in the case of the narcomaniac. It was unfortunate that the existence of the cocaine habit should have prejudiced most unfairly the clinical use of a valuable anaesthetic. Sir William Willcox had stated recently that the claim for any new drug that it would not lead to "addiction habit" needed very careful investigation before it could be accepted, and Dr. Watson-Williams doubted whether there was sufficient evidence in the case of any cocaine substitute to show that it was free from this risk. He felt, however, that the "addict risk" arising out of the surgical use of cocaine had been exaggerated. The comparative clinical value of cocaine substitutes turned largely on the purpose for which an anaesthetic was required, and they must be judged, first according to the method by which anaesthesia was to be induced, and, in the second place, according to the region to be anaesthetized. Apart from the general questions involved, he confined his remarks to surface anaesthesia in laryngological practice. His personal experience of eucaine and butyn was restricted to their use by surface absorption, and he had found that butyn was less efficient than cocaine whilst being equally or even more toxic. These, and indeed all other known substitutes, had the serious defect that adrenaline had to be added if vascular constriction was desired, which often gave rise to prolonged and undesirable after-effects. He therefore avoided adrenaline wherever possible, and restricted his use of eucaine and butyn to such cases as repeated Eustachian catheterization unless ischaemia of the mucosa was desired. He had suggested to his son (Mr. Eric Watson-Williams) a research on the toxicity of cocaine and its substitutes, and the results appeared in the BRITISH MEDICAL JOURNAL of December 1st (p. 1018). The mind of the profession should be disabused of the idea that these cocaine substitutes were safe; they were not safe unless the limits of dosage were very carefully estimated. He mentioned the figures of fatal cases published in the preliminary report of the American Committee on toxicity of local anaesthetics (included in the paper just quoted), and seeing that cocaine was used in far greater frequency than any of its substitutes, and that many of the substitutes indeed were not in general use at all, he urged that these fatalities showed that they must not be regarded as safe. After using cocaine since 1886 in rhinological work, he could not recall any disturbing results when swallowing was precluded and a small volume of a strong solution used: when again it was remembered that cocaine was used in every clinic and that thousands of patients must be having applications on any day, the rarity of accidents, and the paucity of the cases of narcomania which could be traced to these administrations was remarkable. The risk was further reduced by the preliminary or simultaneous use of adrenaline and the alkalinization of cocaine solutions which enabled smaller quantities to be used. Moreover, many of the accidents reported to be due to cocaine were really due to carelessness. He had yet to hear of an efficient substitute for it as an intranasal surface anaesthetic.

Ophthalmology.

Mr. R. FOSTER MOORE approached the subject from the standpoint of an ophthalmologist. The substitutes, not cocaine itself, were to form the subject of the discussion; nevertheless, every speaker must feel bound to take cocaine itself as the standard. From the ophthalmological point of view they had to consider (1) whether any drug or combination of drugs was equal or superior to cocaine in the degree of anaesthesia given and the rapidity with which that anaesthesia was obtained; (2) what amount of irritation followed the use of the various local anaesthetics; (3) the liability to cause desquamation of the corneal epithelium. Toxicity, stability, and other questions also entered into the consideration. From the point of view of infiltration anaesthesia, he thought it might be admitted that novocain in 1 or 2 per cent. solutions could properly take the place of cocaine. Cocaine had power to stimulate the sympathetic nerves, and it had been suggested that this action might prove to be the test of its power to act as a stimulant of the central nervous system and therefore of its liability to become a drug of addiction—a very valuable test if it could be substantiated. He added that he had used stovaine both for inducing superficial anaesthesia and in cataract operations; he had found it unsatisfactory for the latter, and on two occasions had had to complete the operation with cocaine. Butyn anaesthesia he had found satisfactory, but the smarting was rather marked. He knew of no case of drug addiction resulting from clinical applications.

Dentistry.

Mr. F. N. DOUBLEDAY referred to a questionnaire sent out by the British Dental Association, the result of which was that 1,912 dentists replied that they considered cocaine, as distinct from its substitutes, essential in dental practice, while 410 replied that they did not: he ranged himself with the latter. He believed that novocain was a most efficient substitute, and he described its value in dental operations. Most of the other substitutes gave similar results, but with less certainty, and with more marked after-effects. A few patients showed a marked susceptibility to novocain, but these cases were very rare, and he had used novocain widely at Guy's Hospital without any ill effects for patients, many of whom were in poor condition, and some suffering from disease.

Anaesthetics.

Dr. JOSEPH BLOMFIELD said that the use of these drugs in his practice as an anaesthetist was entirely confined to injection, and he had had no experience of their surface applications. He had entirely abandoned the use of cocaine, and he believed most of his fellow anaesthetists had. Novocain in strengths up to 2 per cent. was chiefly used for injections into the sacral cavity. In such injections it was apparently harmless, though occasionally, when large amounts were used, the patient appeared to have something like generalized convulsions, affecting almost every muscle of the body, but this condition passed off. With regard to stovaine, since it had been learned that the chief danger with this drug was the fall of blood pressure which it induced, measures were taken to counteract this, and the drug was used safely.

Otology.

Sir WILLIAM MILLIGAN confined his remarks to the action of butyn. Otological work did not permit of the same range of utility for the employment of a local anaesthetic as did laryngological, rhinological, or dental work, owing chiefly to the configuration of the organ of hearing and its position. Such local anaesthetics as eucaine, stovaine, and novocain all had their champions, but so far as his experience went cocaine had very easily held the field. The advent of any new anaesthetic called for very critical examination from several points of view, first of all as to whether it was of equal or superior effectiveness to the anaesthetic already in use, whether it was reliable, whether it possessed toxic properties, and, if so, how these compared with those of other local anaesthetics. Butyn might be applied to the tissues in fluid or solid form, by subcutaneous injection or by means of infiltration, but it must be allowed to come into intimate contact with the

mucosa of the middle-ear cleft. Its range of utility, therefore, was largely narrowed down to those middle-ear conditions in which the mucosa was exposed either as a result of disease or artificial perforation of the membrana tympani. Applied locally to the mucosa of the middle ear or to the Eustachian orifice, it would be found to produce sufficient anaesthesia within one or two minutes to arrest pain following upon the application of certain caustics, though not of all, but it required repetition before a quite satisfactory and profound anaesthesia resulted. He had had no experience of its toxic properties as applied locally, and he had had no patient who was in any way inconvenienced by its use. In painful affections of the external ear or the external auditory meatus, it could not, applied locally, be of much service in consequence of the nature of the integument. Injected subcutaneously, however, it produced anaesthesia sufficient to permit the opening of a furuncle, though he did not recommend it for this purpose. He had not yet attempted to open the mastoid cells under butyn anaesthesia. In oral work, butyn did not appear on balance to offer any advantages as compared with cocaine. Its tendency to produce hyperæmia seriously prejudiced the many excellent properties the drug otherwise possessed. At the same time, his experience in oral work showed butyn to be more rapid in its action than cocaine, and its potency to be nearly twice that of the older anaesthetic. It could be used quite effectively in lower concentrations than other synthetic anaesthetics. In the early days of his practice he found patients who presented symptoms of cocaine poisoning, but these mishaps had long since passed away, and he had no doubt that they were due to faulty technique. He had had the unfortunate experience of seeing two patients contract the cocaine habit, one a barrister, who constantly used a nasal spray and developed such mental symptoms as necessitated his confinement, though he was now quite well; and the other, a medical man who, as a result of vascular changes, had a severe hemiplegia, which proved fatal.

General Discussion.

Mr. ERIC WATSON-WILLIAMS repeated the statement (given in his paper in this JOURNAL) with regard to the report of the proprietors of butyn on five deaths following clinical application of that drug, but he added that a more recent letter from the proprietors stated that butyn in 1 per cent. solution had been used in over a million extraction cases by dentists in the United States, without a single untoward result. It happened sometimes that trouble was attributed to the anaesthetic when actually the cause was something quite different. One of the most amusing examples was a case seriously recorded in a medical journal (which he named) in this country in which a medical man, having toothache, applied cocaine to his gums, and afterwards, beginning to feel queer, suspected cocaine poisoning, and so took an antidote in the shape of whisky, half a glassful every half-hour. He had a most restless and excited night, but on the following day, although he felt very much out of sorts, all symptoms of cocaine poisoning had disappeared. On the general question of deaths reported following the use of local anaesthetics, especially for tonsillectomy, Mr. Watson-Williams wished to emphasize the foolishness of drawing conclusions from any but complete case reports. In a number of reports recently examined by him no mention was made, for example, of swabbing or spraying the fauces before injecting the tonsils or faucial pillars—an almost universal practice. If strong solutions were used on swabs absorption here might be very rapid, for 5½ minims of a 20 per cent. solution contained 1 grain of cocaine; to give the dose only of the drug *injected* might be very misleading, and cause the quite possibly false impression that small fractions of a grain of cocaine, novocain, or the like could cause death.

Mr. S. F. STJ. STEADMAN, in various dental operations, had usually taken a 2 per cent. solution of novocain, and was fairly satisfied with this drug. On one or two occasions he had failed to obtain satisfactory anaesthesia, and in one man not one of five injections was satisfactory. These cases of failure were in ex-service men who had suffered from shell-shock. On using a butyn solution also he had found in one case no anaesthesia at all and in two other cases very unsatisfactory anaesthesia. By using novocain in freshly prepared distilled water he had abolished after-pain.

Dr. G. WILLIAM HILL was in substantial agreement with Dr. P. Watson-Williams and Sir William Milligan in their reference to the fact that cocaine in experienced hands was not a dangerous drug. At the Portsmouth meeting of the British Medical Association he had read a paper on butyn, but since that paper was written events had moved very rapidly, and it appeared that butyn, although previously thought to be safe, was in fact far from being so. In his own experience, however, he had never found the slightest palpitation nor poisonous effect resulting, and his own observations went to show that butyn was very non-toxic compared with cocaine. At the same time, he damned butyn with faint praise because he found it a very inconvenient drug to use on account of the fact that it was not ischaemic, and that when adrenaline was added this acted as an irritant, so that patients complained not merely of coryza but also of very unpleasant sensations. Further, he found that it was uncertain in its action. Sometimes it failed to anaesthetize altogether, and for this reason principally he felt that it was not worthy of the confidence given to cocaine. While it was true that butyn in his hands had given rise to no toxic symptoms, it was not until his seventeenth observation that he discovered the uncertainty of its action, so that a more extended series of observations might have yielded a toxic case. He had been asked by the Ministry of Health Committee to try stovaine, and his experience was that it was not free from toxic dangers, or at least that it caused toxic symptoms. Altogether he was inclined to think that nothing better than cocaine was at present available.

Dr. ALBERT GRAY dealt with the effect of certain of the anaesthetics locally on the membrana tympani. He had found eucaine, stovaine, and novocain all very much inferior to cocaine so far as the production of anaesthesia of the unbroken membrane was concerned. He had never had any patient who became addicted to the cocaine habit. The nearest he had was a patient in whose case he had been employing watery solutions in the nose, and who began to like this treatment. Since he had used ointments, which were very gradually absorbed, instead of watery solutions, he had had no anxiety on this score.

The CHAIRMAN recalled a case in his early days in which a man—the head draughtsman in an architect's office—became addicted to cocaine as a result of cocaine being used to spray his throat. He came up almost daily with fits of coughing which necessitated the use of a spray if the throat was to be inspected at all. Later he had an accident, which confined him to hospital and made it impossible for him to continue his visits, and he admitted that he had been in the habit of coming, not because of the condition of his throat, but because he wanted the spray, and he was able in the exaltation which ensued to go back to his office and make the most splendid drawings. The circumstances of his accident cured him of the approaching habit.

Mr. T. B. LAYTON gathered from the ophthalmologists that from their point of view the important consideration, next to its anaesthetic property, was the irritant effect of the drug. This was not of the same importance in the nose and throat. It was not possible to compare the surface applications of the laryngologist with the ophthalmic applications for work on the cornea or conjunctiva. What the laryngologist or rhinologist would call a surface application was really comparable with the intraocular operations of the ophthalmologist. With regard to butyn, he had noted from pamphlets supplied by the manufacturers that it was twice as toxic as cocaine; therefore he made it up in half the strength at which he was accustomed to use the cocaine. He had never seen any untoward effect, but he would approach it with more anxiety after having listened to Mr. Eric Watson-Williams. The speaker was unable to distinguish between the toxic symptoms of cocaine and its substitutes and the symptoms obtained in mental states such as fear. He was not at all sure that the latter did not explain many of the symptoms attributed to the drug.

More than one that evening had stated that he used to have these results, but had them no longer, and the speaker suggested that this might be because the technique of application had been better learned, and therefore the surgeon no longer suggested to his patients the symptoms which he himself feared might arise. It was very easy to get toxic symptoms by simply suggesting those symptoms to the patient. One point with regard to adrenaline: there was more danger of reactionary haemorrhage in local than in general anaesthesia, and if one went on adding adrenaline the danger of that reactionary haemorrhage was increased.

Dr. J. B. HORGAN had tried alypin in 10 per cent. solution for surface application on the nose, and had used it about twenty times. It proved to be much more toxic in its action, strength for strength, than cocaine, and he gave it up on that account. He mentioned that 10 per cent. calcium chloride injected intravenously was a rapid and efficient antidote of the severe types of cocaine poisoning.

Dr. A. S. GREEN of Lincoln related his experience as a patient on whom both cocaine and butyn had been used. While the anaesthetic action of cocaine had been very good, it had disagreeable after-effects for a time. Butyn was more satisfactory in this respect, and the anaesthesia was perfect. The sensation in the nose, where the operation took place, was quite different in the case of butyn from what it was with cocaine; with the former the nose felt as if it were frozen.

Mr. SYDNEY SCOTT said that at St. Bartholomew's Hospital twenty-five years ago they were taught that it was exceedingly dangerous to spray the nose with cocaine. The fault was that the old sprays at one squeeze of the bulb would eject a large quantity, some of which might be swallowed. It was very necessary to avoid any swallowing.

Mr. HERBERT TILLEY could only speak of novocain among the substitutes, but of this he had had a fairly large experience. He had used it frequently in resection of the nasal septum and operations on the antrum, and had found it extremely efficient: he had never seen it give rise to dangerous or even to uncomfortable symptoms. He felt, however, that there was no drug which so effectively combined the production of anaesthesia with contraction and retraction of the tissue as cocaine itself. He believed that cocaine might be extremely toxic if used as an injection, but large surface applications seemed quite innocent, perhaps because of some biochemical action of the skin or mucous membrane which, so to speak, filtered out the toxicity.

Dr. P. WATSON-WILLIAMS, in a brief reply on the discussion, said that the profession stood in some danger of getting a wrong mental attitude with regard to cocaine. If a better or more efficient substitute could be obtained it should be adopted, but it seemed a pity that it should now be black-listed so far as its proper clinical use was concerned, because of its social abuse in the past. He thought it ought to stand on a par with any substitute which was brought forward. It was unscientific to start out with the idea that cocaine must be tabooed when such taboo meant the acceptance of something clinically inferior.

ANAESTHETIC PRACTICE.

A MEETING of the Section of Anaesthetics of the Royal Society of Medicine was held under the presidency of Dr. A. L. FLEMMING at the Medical Institute, Edmund Street, Birmingham, on Saturday, December 1st. The time at the disposal of the Section was cut short by the lateness of the arrival of the train bringing the London members.

Dr. K. B. PINSON opened the proceedings with a paper on the condensation of dimethyl ether, and its use as an anaesthetic. He said that when he promised to read the paper his experiments were not yet completed; owing to a succession of accidents they were still unfinished, and he was not able personally to give the drug as an anaesthetic before he read his communication. His attention had been called to it when reading Gwathmey's book by a statement that W. B. Richardson had administered it in some twenty-seven cases and was favourably impressed. Accordingly Dr. Pinson had attempted to prepare and condense the drug with the object of administering it as an anaesthetic. The ideal anaesthetic should be easy and quick in induction, pleasant to take, non-irritating, easily controlled, and quickly eliminated. A gas was more likely to possess these attributes than a fluid. Dimethyl ether at normal pressure and temperature was a gas. Its physical properties were not well known. It might act on metals and on oils and might therefore be difficult to condense, as it might act on the apparatus used for compression. In his experiments he found that it boiled at -24° C., and that at 100° C. it exerted a pressure of 97 lb. to the square inch, and could thus be safely stored in cylinders. He had only got so far in his experiments when the apparatus used exploded and the small quantity of the gas he had been able to procure was totally lost. So far he had not been able to obtain a further supply. He had, however, found that the gas condensed into a thin, limpid, mobile liquid with a slightly ethereal pleasant odour. He concluded by demonstrating the apparatus with which he had conducted his experiments, and explaining the difficulties met with.

Mr. LEONARD GAMGEE, in his paper entitled "A surgeon's thoughts on anaesthesia," stressed the necessity for the complete co-operation of surgeon and anaesthetist, especially in the more complicated operations, such as those on the thyroid gland. At such operations everything in the theatre, including the surgeon and his assistants, should be ready for the operation before the anaesthesia was even started, so that if any respiratory obstruction occurred the surgeon could at once relieve this by rapidly cutting through the superficial muscular layers. Later on, when pulling on the lobe of the gland to free it from the trachea, he should be prepared to let it fall back in its bed should obstruction arise. A surgeon should never dilate the sphincter ani without informing the anaesthetist that he was about to do so, as there was risk of collapse should this be done with the patient too lightly anaesthetized. Mr. Gamgee quoted in this connexion a death resulting from the division of the corpora cavernosa when the patient was in a state of light narcosis during an operation for amputation of the penis. In this case the surgeon could not be freed from blame as he had not warned the anaesthetist of his intention to divide the organs. Lightness of anaesthesia had distinct dangers, and added to the risk of operation and after-shock. There were also other risks. One of these was an inefficient operation, and another, forcible expiratory breathing, especially under ether, of uncertain origin, but possibly due to the surgeon starting too soon. Another possible cause was that ether had been given too long, and this was noticeable in operations upon the upper abdomen. Hampered by this type of breathing, the operator should inform the anaesthetist and give him time to get a deeper anaesthesia. In regard to pre-operative drugging, the tendency nowadays was to give too many drugs before operation.

Respiration was depressed after scopolamine and morphine, sometimes even to the extent of producing a sort of Cheyne-Stokes breathing. While morphine alone was less objectionable, cyanosis and shallow breathing were common sequels; moreover, the patient was apt to remain unconscious longer than was desirable. Morphine should never be given without the knowledge and consent of the surgeon. Atropine came under a different category and could be left to the discretion of the anaesthetist. Ether was the safest anaesthetic, but had after-effects often undesirable. It should not be given for more than half an hour. The complications were due to a lowering of resistance and possibly also to direct inhalation of septic organisms as the result of the deep expiratory breathing already referred to. Gas and oxygen, while valuable, nearly always required reinforcement in abdominal cases, and, except in expert hands, were not as safe as ether. Why was it that the Vernon-Harcourt inhaler was not more used? By it chloroform could be given safely, and with comfort to the surgeon also. The mask and drop-bottle, so far as chloroform was concerned, were a danger in the hands of the inexperienced. Plenty of chloroform and plenty of air was an excellent motto, but one that could not be followed when using a mask covered with ever so many layers of material. A folded

towel held at some distance from the face and freely sprinkled with chloroform was both safe and efficient. The danger signal was pallor of the face, and when this occurred no more chloroform should be given. The best ether apparatus was the Clover machine or its modification by Hewitt. So-called open ether was not open ether at all, but a smothering of the patient accompanied by partial narcosis of the anaesthetist and the whole of the surgical staff, resulting from the amount of ether distributed to the surrounding air. Mr. Gamgee then touched on the psychological element in the taking of anaesthetics. Seldom was trouble experienced in anaesthetizing acute cases; such patients were only too pleased to inhale the drugs in search of relief from pain. It was otherwise when dealing with interval cases of appendicitis, hernias, and operations of that kind; trouble was often experienced in such cases. Theatres were often kept a great deal too hot. By taking a patient from a warm theatre into a cold corridor, down a draughty lift, into a ward in which the breezes were apt to blow from open windows, post-operative bronchitis was more than likely to follow. This was rare in nursing homes and very rare in private houses after operation. Many of the difficulties of the anaesthetist could be put to the blame of the surgeon, and many could be put to the blame of both. The anaesthetist should get the patient sufficiently under for the comfort of the surgeon, and the surgeon should tell the anaesthetist all that he knew concerning the patient, as in many operations the anaesthetist really ran the greater risks. The surgeon should always work with the anaesthetist, curb his own ardour, and be prepared to wait.

Dr. A. L. FLEMMING remarked that chloroform was not taught to the same extent as ether administration, and considered this the direct result of the strictures of coroners when holding inquests on fatalities. He advocated the provision of recovery wards, but these should not be made too attractive or they would be seized by the surgeon, always voracious for empty beds. Such wards, therefore, should be earmarked solely for the purpose for which they were provided; they should be near the theatre to obviate the use of lifts, and should be specially staffed.

Mr. W. BILLINGTON said that anaesthetics were a necessary evil, but if there was danger of explosion, as seemed to be the case with Dr. Pinson's anaesthetic, the evil was increased. As regards scopolamine and morphine, there was danger of acetonaemia following their use. They should never be administered if a psychical disturbance were present. He preferred to administer morphine earlier than was the custom so that some of its immediate effects had passed off before the anaesthetic was administered. He preferred the preparation omnopon to the usual morphine salts. More rapid elimination could be secured by giving the patient large doses of fluids before the anaesthetic was given, and plenty of fluid afterwards. The collapse that sometimes occurred early in operations such as hernia and interval appendicitis operations could be remedied by the prompt use of pituitrin. He then described the method of giving anaesthetics practised at the Mayo Clinic.

Professor HOBDAY stated that, contrary to the usual statements, dogs were ideal patients for the administration of chloroform, provided this was given by means of a suitable apparatus. He showed a portable apparatus which was, he said, both cheap and efficient.

Dr. WALTER JORDAN said that by an accident he was still an anaesthetist although he had gone over to the physicians many years ago. He had forgotten to resign an appointment at the Orthopaedic Hospital, with the result that he had given chloroform there in over 11,200 cases. He had never had a case of acetonaemia, pneumonia had never been seen by him after administration, and death had occurred only once, and in that case the patient was over 70 years of age.

As the time available had now practically come to an end, Dr. Kirkby Thomas demonstrated a new intratracheal apparatus for the administration of ether and chloroform, after which the members moved to the Union Club to enjoy the hospitality of the Birmingham anaesthetists.

METHODS OF BLOOD CULTURE.

SIR CLIFFORD ALLBUTT occupied the chair at the meeting of the Section of Comparative Medicine of the Royal Society of Medicine held on November 28th, when a paper was read by Dr. S. G. BILLINGTON on some unusual methods of culturing the blood, with special reference to distemper. Dr. Billington first dealt with the development of certain "coccoid bodies" which made their appearance when small quantities of blood were incubated for five to thirty minutes at 60° C. in a medium consisting of distilled water containing 0.5 per cent. ammonium carbonate or neutral lemco broth containing 0.05 per cent. ammonium citrate; emulsions of these "coccoid bodies" had been used as therapeutic agents in infective disease, and it was claimed that they exerted some antibacterial effect. Similar media had been used for culturing bacteria from the blood, and by the use of a special technique successful cultures were obtained from a large number of cases in three to ten days. In order to obtain positive cultures there must be the correct proportion of blood to medium, the reaction must be neutral, and the serum or plasma concentration must be correct. In order to check the cultural results obtained Dr. Billington determined to investigate a specific disease of unknown cause and selected distemper, for if the cultural methods described were sound they should yield a constant organism. An outbreak of distemper at the North Stafford kennels provided him with material for twenty-five blood cultures, and fifteen other blood cultures were obtained from sporadic cases of distemper in the Wolverhampton area. The most constant organism obtained was a pleomorphic Gram-negative bacillus which grew best at about 25° C. and failed to grow at body temperature. The 25 blood cultures from the foxhounds yielded 22 positives and the 15 cultures from the Wolverhampton dogs 13 positives. Other bacteria were frequently present with this bacillus. The organism was described as being diphtheroid both in form and grouping, non-motile, and not producing acid or gas in glucose, lactose, saccharose, maltose, dulcite, or mannite. Dr. Billington shared the common belief that the actual causal organism of distemper was a filtrable virus, but he expressed the opinion that these associated bacilli might be utilized to type the disease and to provide prophylactic and therapeutic remedies. He reported some very favourable results obtained by employing an agglutinated haemo-vaccine prepared from the "coccoid body" emulsions, and demonstrated slides and films of the "coccoid bodies" from blood and the bacteria obtained by special cultural technique.

Major CHAMBERS and Mr. TRIGGER both expressed themselves as having been very favourably impressed by the clinical results obtained with Dr. Billington's haemo-vaccine.

Dr. DOUGLAS declared that it was difficult to criticize Dr. Billington's work without having attempted to repeat his experiments, but he stated that it seemed extraordinary that these "coccoid bodies" should develop into bacteria, for they looked to him like débris of organic matter. He remarked that very little information had been given by Dr. Billington of the nature of these bacteria when obtained in pure culture. If the blood of a dog suffering from distemper were taken whilst the temperature was rising and injected into a susceptible puppy distemper could be induced in this second animal. Also Ferry's bacillus had been frequently found in the blood, lungs, and trachea of dogs with distemper, and some workers had used this organism successfully for vaccine treatment. But Ferry's bacillus was not always present.

Sir WILLIAM LEISHMAN pointed to the many pitfalls which must be avoided before concluding that one organism evolved into another; merely morphological records were liable to be unsatisfactory. Many of the films appeared to him like mixed cultures, but the clinical results reported seemed promising.

Dr. ROWLANDS remarked that bacteria were often found in the blood in other diseases, such as swine fever, where they had no causal relationship to the disease. He was not persuaded that the "coccoid bodies" developed into bacteria.

Dr. MERVYN GORDON asked if the "coccoid bodies" dissolved in 1 per cent. NaOH or 1 per cent. acetic acid. He had come across similar bodies when examining cultures on boiled blood media. These "coccoid bodies" were easily distinguished from the granules obtained in filtrates from influenza. With regard to the good results claimed from vaccine treatment he suggested that the filter-passing virus of distemper might be adsorbed on to the "coccoid bodies."

Professor F. HOBDAY explained that he was not qualified to criticize the bacteriological details, but was deeply interested in the successful results of vaccine treatment, and thanked Dr. Billington for coming to London to impart his views. Dr. BARRATT suggested that the evolution of these coccoid bodies might be examined by dark-ground illumination.

Dr. BILLINGTON, in his reply, declared that many of the ordinary methods of performing blood culture were unsatisfactory; it was for this reason that he commenced his researches. He agreed that many of the points raised demanded further investigation. He did not claim that the bacillus isolated was the actual cause of distemper, but groups of bacteria were often associated together in disease—such as staphylococci with Pfeiffer's bacillus in influenza. In reply to Dr. Gordon he confessed he had not tried the effects of NaOH and acetic acid on the "coccoid bodies"; the size of these bodies varied with the concentration of calcium citrate and serum in the medium. The antibacterial properties of his vaccine might be due to the "coccoid bodies" or some hitherto unrecognized element.

DISEASES OF CHILDREN.

A MEETING of the Section for the Study of Diseases of Children of the Royal Society of Medicine was held on November 23rd, with Mr. R. H. ANGLIN WHITELOCKE, President, in the chair, when Dr. J. D. ROLLESTON showed a specimen of hairball of the stomach.

The specimen was from a girl aged 15, an epileptic idiot, who suffered from vomiting and diarrhoea for a week before her death. A mass was found in the epigastrium which was thought to be the enlarged right lobe of the liver. On *post-mortem* examination the stomach was found to be filled with a collection of hair which formed a complete cast of that organ. On inquiry from the mother it was learned that the patient had been in the habit of eating her hair since she was a baby.

Dr. Rolleston reviewed the bibliography of this subject. He considered the *x*-ray appearance so distinctive—the hairball appearing a lighter area in the midst of the dark shadow of the bismuth—that a correct diagnosis should now be the rule instead of the exception. Mr. H. A. T. FAIRBANK showed a photograph of a hairball removed from the ileum of a girl aged 8 years, whose symptoms resembled those of partial obstruction.

Dr. W. E. ROBINSON showed a case of lymphangioma of the foot in a child aged 7 months. The foot was noticed to be growing larger, especially in the region of the metatarsal bones and terminal phalanges. The *x* rays, however, showed the bones to be perfectly normal. He asked for suggestions as to treatment. Mr. C. MAX PAGE suggested that a Syme's amputation appeared to be the most rational surgical treatment for this case. Mr. H. A. T. FAIRBANK suggested that the diagnosis should be that of hypertrophy of the foot, and agreed with Mr. Max Page as to treatment.

Dr. BENJAMIN showed, for Dr. Robert Hutchison, a case of precocious puberty.

The child, now aged 3½ years, began menstruation at the age of 17 months and had continued to do so at more or less regular intervals of one month up to the present date. The breasts were well formed and hair was present in the pubic region. Her weight and height were that of a child of 8 years. Mentally she was normal for her age, but had fits of bad temper. The carpal bones were ossified. He placed this case by a process of exclusion amongst those due to ovarian hypersecretion, although under an anaesthetic no definite evidence of this could be obtained.

Dr. C. WORSTER-DROUGHT showed a case of progressive neural muscular atrophy (peroneal or Charcot-Marie-Tooth type) in which the upper limbs were also affected.

The patient, aged 13, was one of a family of three, the other two not being affected. After the age of 2½ it was noticed that she turned her toes in and tended to fall down when she walked. During the past four years her feet had become more deformed and the hands and arms have wasted considerably. Her present condition showed her to be thin and nervous, constantly wriggling her feet and legs. There was a tendency to bilateral main en griffe with marked wasting of the small muscles of the hand. The lower extremities showed pronounced talipes equino-varus of both feet with wasting of the peronei. The electrical reactions were given in detail.

Dr. Worster-Drought remarked on the difficulty in drawing a hard and fast line between certain neural atrophies, nuclear atrophies, and muscular dystrophies. Dr. NEILL HOBHOUSE gave the details of a similar but less marked case. The remarkable feature of his case was that one femur was smaller than the other.

Dr. NORAH SCHUSTER and Dr. DONALD PATERSON showed a specimen from a case of paroxysmal tachycardia in an infant aged 9 weeks.

The specimen was the heart from a female child who had been admitted to the Infants' Hospital, Vincent Square, for blueness and shortness of breath from birth. The infant weighed 8 lb. When first seen it was wasted, feeble, and cyanosed, with a pulse of 200 to the minute. The heart seemed enlarged, as also was the liver. During her two days in hospital before death there occurred four different paroxysmal attacks lasting about ten minutes each, during which the infant had marked dyspnoea and cyanosis and was in obvious distress. The pulse at these periods became uncountable, afterwards falling as low as 140. Digitalis had no effect. On *post-mortem* examination a patent interventricular septum, patent foramen ovale, and patent ductus arteriosus were found. The pulmonary artery arose from the left ventricle and the aorta from the right ventricle. Microscopically the heart muscle showed degeneration with intercellular fibrosis.

Dr. GEORGE SUTHERLAND considered the case a very rare one, and cited a similar case of paroxysms of tachycardia which had been mistaken for petit mal. Dr. PARKES WEBER suggested that the cases reported in French literature under the heading of paroxysmal cyanosis were similar to this case. Dr. DONALD PATERSON, in reply, agreed that the reported cases were very few, but considered that attacks of blueness with rapid breathing were not uncommon in children with congenital heart disease. He wondered how many of these might turn out to be cases similar to the one reported were they as closely observed as this one had been. It was only by having the pulse charted hourly and specially taken during attacks that the condition could be diagnosed.

RADIOGRAPHY OF THE FOETUS.

A MEETING of the Obstetric and Gynaecological Section of the Royal Society of Medicine was held on December 6th, with the President, Dr. CUTHBERT LOCKYER, in the chair.

Dr. T. I. CANDY read a paper of very great interest on radiography of the foetus *in utero*. He referred to various technical difficulties and explained how these had been overcome. He was now able to obtain a satisfactory picture after an exposure of not more than five seconds. It was difficult to believe that so short an exposure could possibly harm the mother or foetus. In certain cases pregnancy had been demonstrated at a very early stage. Positive evidence was naturally irrefutable, and he was even inclined to regard negative evidence as definite in cases of supposed pregnancy of six months' duration or more. Pneumoperitoneum had been practised in certain clinics abroad as a means of facilitating *x*-ray demonstrations, but he regarded this procedure as unjustifiable. The advantages of radiography were obvious. It had hitherto been used most frequently perhaps to diagnose multiple pregnancy; it was of further value in demonstrating the position and lie of the foetus, the date of the pregnancy, and the relative sizes of the foetal head and maternal pelvis in cases of doubt. It had been interesting to observe instances of rapid change of position of the foetus *in utero;* also to note the marked separation at the sacro-iliac joints quite early in pregnancy. The recent judgement in the French courts raised points of considerable medico-legal importance.

Dr. GEOFFREY FILDES exhibited reproductions of illustrative radiographs. In one case he had been able to detect the existence of twins *in utero* eleven weeks after the last menstrual period. He had attempted to localize the placenta, but was not as yet satisfied with his results; although, in a case of placenta praevia, the evidence appeared to be sufficiently definite.

In reply to Dr. EDEN, who suggested that *x* rays might be of value in following the course of the foetal head in labour, Dr. ROBERT KNOX said that he had already had an opportunity of witnessing a demonstration in America.

Mr. T. G. STEVENS showed two interesting specimens: an endothelioma of Bartholin's gland, and an ovarian cyst exhibiting a very early stage of papilliferous growth. The latter gave rise to a brief discussion as to the origin of this type of ovarian neoplasm. Dr. HERBERT SPENCER emphasized the advisability of removing both ovaries in cases of papilliferous cyst where the nature of the growth was discovered at operation.

Mr. J. BRIGHT BANISTER demonstrated a sarcoma of the Fallopian tube; a carcinoma of the Fallopian tube; and a uterus in which the scar of Caesarean section had ruptured at an early stage of labour. On inquiry, he had found the Caesarean section to have been performed at the previous (first) confinement on account of obstructed labour; the uterine wound had been sutured with silk, and the puerperium had been complicated by sepsis. Mr. EARDLEY HOLLAND referred to statistics indicating that Caesarean section scars had ruptured more frequently before the onset or at an early stage of labour rather than later in its course.

Dr. VICTOR LACK communicated a report of a case of cyst development in an autogenous ovarian graft. The graft, subsequently removed, had been found to contain ova in follicles, and follicular cysts. After the primary operation (double oöphorectomy and implantation of the graft into the abdominal wall) a period of amenorrhoea had been followed by the re-establishment of menstruation and eventually by excessive uterine haemorrhage. In the few cases previously recorded menorrhagia had similarly accompanied cyst development. This fact suggested an hypothesis as to the relationship of ovulation to menstruation. The PRESIDENT suggested that only the medullary tissue of the ovary should be used for purposes of grafting.

SPRUE AND COELIAC DISEASE.

AT a meeting of the Section of Tropical Diseases and Parasitology of the Royal Society of Medicine on December 3rd a discussion took place on sprue and coeliac disease.

Sir LEONARD ROGERS, in opening, said that a large number of theories with regard to any particular disease indicated that we were ignorant of its real nature; that was especially true with regard to the causation of sprue—a group of symptoms which might be produced by several etiological factors, the essential factor being still unknown. The various theories might be divided into two groups: those suggesting digestive changes, and the infective theories. Of the latter the most important was that which ascribed sprue to the action of the yeast group of fungi. *Monilia psilosis* had also been suggested. It was probable, however, that yeast fungi were merely an aggravating secondary infection. Organisms of the group *Streptococcus viridans* had been identified, and good results had been obtained from the use of oral streptococcal vaccines. The great loss of colour in the stools lent weight to the theory of digestive deficiency, there being an excess of fat in the stools. In order to discover the originating factor of the disease it was necessary to study the early stages. Sir Patrick Manson had stated twenty predisposing causes, from long endemic residence to fistula and miscarriages. Hill-diarrhoea in India was a very important predisposing cause which threw great light on the subject, as the digestive changes in that disease had a suggestive similarity to sprue, and neglected hill-diarrhoea very often developed into sprue. Hill-diarrhoea was not infective, and would immediately cease upon removing the patient to a lower level. There was strong evidence for the belief that deficiency in vitamins was a predisposing cause of sprue, a diet of tomatoes and marmite giving good results, although marmite was an extract of yeast, the very fungus which was supposed to cause sprue. Vaccines had been used with a certain measure of success. Extraordinarily rapid recoveries had resulted from treatment on the theory of calcium deficiency.

Dr. REGINALD MILLER said that owing to insufficient knowledge of the two diseases there was no agreement as to whether coeliac disease was the same as sprue; but there were notable differences. Coeliac disease always originated in childhood, and, even without treatment, there was amelioration as maturity was reached. It was very seldom fatal, and did not occur in epidemics. Among children the essential feature of the disease was disorder of fat absorption, and it had nothing to do with intestinal disease, in many cases there being no diarrhoea, and usually no ulceration of the tongue. The stools were pale, unformed, frequent, excessively offensive, and contained a large excess of fat. The treatment consisted in withholding fat, and subsequently administering alkalis, the object being to convert irritating fatty acids into non-irritating soaps. Bile salts were also given. He was sure that coeliac disease was not a disease of the pancreas, nor was it an organic disease.

Dr. A. CASTELLANI said that infections by monilia and streptococcus were secondary. He had never had the slightest result from the use of monilia vaccines. He did not agree with the theory that sprue originated in syphilis. He had never found santonin treatment successful; alkaline treatment was certainly useful.

Dr. H. H. SCOTT read a paper on the nature and treatment of sprue, which is published in full at page 1135.

Dr. ARTHUR POWELL emphasized the differences between coeliac disease and sprue. In sprue *post-mortem* examination invariably revealed a shrinkage of the liver, great attenuation of the stomach, with loss of epithelium; these conditions were not observed in coeliac disease, which was characterized by enlarged spleen and great pain in the abdomen. Vomiting was more frequent in coeliac disease than in sprue. In coeliac disease the appetite was poor and capricious, whereas, unfortunately, in sprue it was the opposite. There was a tendency to dropsy in coeliac disease, while there was shrinkage of the body in sprue. In sprue he had known the pancreas to show the symptoms of syphilis.

Lieutenant-Colonel W. P. MACARTHUR said he had tried calcium and parathyroid extract with success in cases of sprue.

Dr. LOW said he had known cases of sprue—if it were sprue—in which the disease had developed ten years after the patient had returned to England. The curing of the septic condition of the mouth had been extremely beneficial, although he believed the effect was secondary. It was extremely difficult to know when a permanent cure had been effected.

Sir LEONARD ROGERS, in reply, said that he thought sprue might be due to the fact that vitamins were not properly digested, and not to any lack in the diet.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of the Liverpool Medical Institution held on November 29th, with the President, Professor J. HILL ABRAM, in the chair, Dr. W. JOHNSON read a note on acute infectious polyneuritis. He said that among the rarer forms of multiple peripheral neuritis was that known as auto-infectious or acute toxic polyneuritis. He gave a short account of two cases he had seen recently and pointed out that the disorder was usually ushered in by what the patient described as a "chill" or "influenza." There might be a variable interval between such a chill and the onset of the neuritic symptoms. These usually began as sensations of numbness and tingling in the toes and fingers, followed by marked motor weakness in all four limbs. Soon, the facial muscles became affected, and this observation, combined with, later, the occurrence of trunk muscle weakness, served to indicate the correct diagnosis. Sensation was dulled over the distal portions of the extremities, but the sensory loss was usually much less marked than the motor loss. Apart from other forms of peripheral neuritis, the condition might simulate Landry's paralysis and acute ascending myelitis at the outset. The peripheral distribution of the symptoms, the disordered sensation, and the presence of facial paralysis were the chief points which would lead to the diagnosis of acute infectious polyneuritis. The cerebro-spinal fluid showed no definite change.

Mr. LEYLAND ROBINSON said that the disease in one of Dr. Johnson's cases might be associated with a transfusion

of whole blood which had been carried out for post-partum haemorrhage two weeks before the onset of the neuritic symptoms. Polyneuritis was recognized as a rare complication of parturition and due to pregnancy toxaemia (pernicious vomiting) or puerperal septicaemia, both of which could be excluded in this patient. The clinical features so closely resembled the type seen in France during the war as to suggest a common etiology, and although the donor gave no history of neuritis he had served in France and might be a carrier of the disease. The patient subsequently became pregnant and had been delivered by Caesarean section at full term; pregnancy and the puerperium were uneventful.

Mr. G. P. NEWBOLT read a note on four cases of intestinal obstruction caused by gall stones. Three of the patients were women, all of whom recovered; one was a male, who died. The symptoms were those of intestinal obstruction. Faecal vomiting with intermissions was present. Constipation was not absolute and there was not much abdominal distension. The patients were all stout and elderly, one woman weighing 19 st. The chemical examination of the last stone removed was that of a typical gall stone.

Mr. G. C. E. SIMPSON said that he had seen two cases of this condition, both in women. One, aged 70, died of pneumonia after operation. In the other case gall stones were diagnosed but the vomiting passed so insensibly into the vomiting of obstruction that some days were lost: in the latter case on exploration the adhesion of the gall bladder to the duodenal angle was seen and two stones were felt firmly impacted low down in the common duct. Presumably the fistula first formed in the initial severe attack, the only attack accompanied by jaundice, six months before the big stone passed and gave rise to obstruction. Operation on the biliary region had not yet been undertaken.

Dr. C. O. STALLYBRASS read a paper on the recent outbreak of encephalitis lethargica. Having referred to the past history of the disease, he said that while it was not new its pandemic extension was a new feature. As the disease spread there had been observed in France, Italy, etc., a tendency to evolve from a type presenting depression of function to one exhibiting exaltation of function; instead of palsies, lethargy, and somnolence, there were involuntary movements, delirium, and sleeplessness. In Liverpool, in 1921, 81 per cent. of the cases were of the first type. In the winter of 1922-23 a considerable outbreak involving over a hundred cases occurred and only 52 per cent. were of the first type. The delirium was usually occupational. Alteration in type was accompanied by increased fatality as well in the lethargic as in the overactive type; age incidence was identical in both types. A definite history of contact with a preceding case was found in 9 per cent. of the cases. Dr. Stallybrass described four abortive cases. The virus he regarded as a variable one which at times exhibited marked malignancy and increased pathogenicity, as at Derby, Rudduvoorde, and, probably, at Mülheim.

Dr. A. G. GULLAN said that he had first seen cases of encephalitis lethargica at the end of 1919, when they were of the lethargic type, and though they were not paralysed the patients lay motionless in bed, were only roused with difficulty, and spoke in a monotonous, toneless voice. The only sign of interest the patients showed was by asking in a feeble voice "whether they were going to recover." He agreed that the expressionless face was the most characteristic symptom of the disease, both in the lethargic and in the restless varieties. In 1922 he saw a considerable number of cases of the excited form in which choreic movements, wakefulness, and in some instances occupational delirium were present. Dr. Gullan added that his mortality was considerably lower than that given for the whole of Liverpool: at the present time he had in his wards a case of the lethargic type which gave a previous history of trauma.

PYELOGRAPHY.

AT a meeting of the Royal Medico-Chirurgical Society of Glasgow held on November 16th, with Dr. LEONARD FINDLAY, Vice-President, in the chair, Mr. Walter W. Galbraith made a communication on pyelography.

In a short foreword Mr. M. LOGAN TAYLOR, to whom Mr. Galbraith was indebted for the clinical facilities for the investigation, referred to the great practical value of pyelography as an aid in the diagnosis and treatment of genito-urinary cases. He emphasized the fact that no bladder or kidney case in his wards was operated on without the most searching examination—cystoscopic, radiographic, and chemical—of the whole genito-urinary tract, and expressed his appreciation of the thorough and enthusiastic way in which Mr. Galbraith had carried out this work.

Mr. GALBRAITH said that the purpose of his communication was to show that pyelography could be accomplished without danger and with only a minimum of discomfort to the patient and that it was a valuable aid to diagnosis. He began by considering in detail the possible sources of danger—(1) the opaque solution, (2) the pressure used in making the injection, (3) sepsis, (4) trauma to the ureter or renal pelvis, (5) constitutional disturbance—and explained how they had been eliminated by him. He then described the technique, emphasizing his opinion that general anaesthesia was unnecessary and in fact contraindicated. The fluid used for bladder lavage was a solution of mercury oxycyanide 1 in 4,000; for injecting the renal pelvis he had found after experiment that sodium iodide 12 per cent. was most suitable. To avoid trauma he never employed a ureter catheter of larger size than No. 5 (French scale), and this was passed, in the absence of any obstruction, for a distance not exceeding 28 cm. Great care must be used in avoiding any pain or discomfort whatever in the loin as indicating overdistension of the renal pelvis. With this end in view the only force used in making the injection was the weight of the piston of a delicately balanced 10 c.cm. Record syringe held about two inches above the level of the kidney, and the amount of fluid injected did not exceed 5 c.cm. unless the pelvis was distended, as indicated by previous aspiration or pyelogram. The pyelogram was then taken and the fluid aspirated. By attention to this technique he had never found any ill effects follow the procedure, nor had any of the patients complained of pain or discomfort other than that due to the passing of the cystoscope. Mr. Galbraith then showed a series of lantern slides and the original films, illustrative of the conditions in which pyelography had proved of value. Among these conditions were:

(1) Cases of typical renal colic pain in which the ordinary *x* ray was negative; here pyelography demonstrated the presence of hydronephrosis, etc. (2) Cases of renal colic pain in which the *x* ray showed a shadow in the region of the kidney or ureter; here pyelography demonstrated the exact relation of the shadow to the kidney or ureter. (3) Cases of renal colic pain in which the *x* ray showed the shadow of a calculus; here pyelography demonstrated the exact site of the shadow, thus facilitating the removal at operation. (4) Cases of indefinite urinary symptoms in which, with a negative *x*-ray and cystoscope examination, pyelography showed an abnormal condition of the renal pelvis, due, for example, to tumour. (5) Cases of kidney disease in which the condition and function of the supposedly normal kidney could be more accurately determined.

In the discussion which followed Dr. LEONARD FINDLAY referred to the difficulty encountered in the application of the method to children; and Mr. ARCHIBALD YOUNG, Mr. J. MILL RENTON, and Dr. JOHN RITCHIE also took part.

TREATMENT OF CANCER OF THE UTERUS BY X RAYS.

A MEETING of the Section of Obstetrics of the Royal Academy of Medicine in Ireland was held on October 26th, with the President, Dr. LOUIS L. CASSIDY, in the chair, when Dr. ZWEIFEL of Munich read a paper on the treatment of cancer of the cervix uteri by deep *x*-ray therapy.

Having described the apparatus Dr. Zweifel said that there were three different methods of treatment: (1) primary radium or *x* rays, followed by operation; (2) operation followed by radium and *x*-ray treatment; (3) treatment followed by either radium or *x* rays, or both combined. Of twenty-one gynaecological clinics in Germany, in fifteen operation was performed upon all operable cases, and in the other six every patient was treated by *x* rays or radium. He pointed out that in Bumm's clinic in Berlin

in a long series of cases the percentage of definite cures after operation had been doubled by post-operative *x*-ray treatment. The unit skin dose of *x* rays was that which after six to eight days produced a red discoloration of the skin and after three to four weeks produced toning. If this unit skin dose was represented by 100, then the cancer dose, as determined by Seitz and Wintz, was from 90 to 110. The depth of the cervix from the abdominal wall was from 7 to 10 cm., and experiment had shown that at that depth the effective dose was 20 per cent. of the surface dose, so that the rays had to be concentrated from six or seven fields in order to get the cancer dose at that depth. As it was not possible by that method to radiate the whole pelvic cavity effectively at one sitting, the tumour itself was radiated first, and after about six weeks' interval the parametria were treated. The duration of the radiation for each field was about half an hour. The after-treatment was of great importance, as cure depended upon the ability of the organs to react against the cancerous disease. The treatment was attended with considerable risk to both the operator and the patient, and should be regarded as a major operation.

Of all patients treated for cancer by deep therapy about 20 per cent. could be cured, and of all operable cases about 50 per cent. could be cured for five years or longer. When cure was not obtained great relief from the symptoms was often obtained.

Dr. MAURICE HAYES said that deep *x*-ray therapy was not new. The only new thing was that with improvements in the apparatus they were now able to produce a more penetrating ray than formerly. They were now working with apparatus which could produce continuously a voltage of about 200,000. Dr. Zweifel had sounded a note of warning which he was glad to hear. Deep *x*-ray therapy was a major operation, but the shock after the treatment, which was as great as that which followed hysterectomy, depended more or less on the method in which the therapy was produced.

Dr. PILGER (Erlangen) said that he thought *x* rays could be considered as a medicament, and that there should be certain doses for the different parts of the body. This dosage had of late years been more accurately determined than formerly, but there were still great difficulties to be overcome in connexion with it, and they were really still in the dark on the subject, as all they knew was that a certain amount of *x* rays would produce a certain amount of cure. Certain doses had been determined for certain parts of the body, but it had still to be determined which doses gave the best percentage of cures. The human body was a very complex construction, and therefore it was very difficult to be sure whether one was giving the right dose or not. In cases in which it were possible he thought an operation should be performed before treatment by *x* rays was tried, unless a very extensive operation would be necessary, the result of which would be uncertain, and in such cases treatment by *x* rays should be considered. It was not a question of competition between operative treatment and *x*-ray treatment, but a question of doing whichever it was thought would be best for the patient.

Dr. T. G. HARDMAN, Dr. W. C. STEVENSON, and Dr. C. M. O'BRIEN also took part in the discussion, and a vote of thanks to Dr. Zweifel was unanimously carried.

A MEETING of the Birmingham and District Medical Women's Association was held on November 17th, when Dr. MARY GORDON, late H.M. Inspector of Prisons, spoke on analytical psychology. She referred to that large unexplored territory of the mind now recognized as functioning unconsciously, and to the valuable contributions that had been made to the knowledge of psychology through the researches of scientific observers in every field. Modern psychology signified the coming of a new realization of ourselves, and although it was, as yet, little understood, it had already thrown a flash of expectancy round the world. Dr. Gordon referred to the dislocations of all kinds met with in those who were, in some way or another, in the power of the unconscious, and which brought the sufferer to the medical practitioner. Life could only be understood by living it. Dr. Gordon explained the four orientating mental functions—thinking, feeling, intuition, and sensation—and showed how the almost exclusive use of one of these could cause this and that to become inferior and unconscious. She gave illustrations of the effects of this one-sided development on vital human relations. She described the irrational mentality of primitive man as illustrating the primitive and archaic characters taken on by any part of the mind that was mainly unconscious. Only a conscious differentiated individual could make things happen; to all others things simply happened. She described the typical attitudes of introversion and extroversion, and the reactions of the individual to these. The unconscious part of life and mind must not be regarded as necessarily morbid. The accumulation of energy, tension, and explosion in the unconscious was the biological way by which the individual was carried forward to new adaptations to life. Only when a man knew himself and was his own could he touch his world creatively. This was what a thorough analysis stood for, and it resulted in an enlargement of understanding and of life that was well worth while.

Reviews.

CONTROL OF THE TRAFFIC IN ALCOHOL.

DR. ARTHUR SHADWELL'S new book *Drink in 1914-1922: A Lesson in Control*[1] is an important contribution to the study of the problems raised for the whole community by the misguided individuals who indulge unduly in alcohol. It gives a general account of the measures of control taken in this country during the war, and though other writers have dealt with the subject previously, and most of the figures given are available elsewhere, the author's judgements upon the results attained by control are of very special interest, because he has devoted many years to the study of temperance reform, and, what is most important, still finds it possible to write as a man of science rather than as a propagandist. This is a rare virtue in publications dealing with drink control legislation, for, as Dr. Shadwell says, "I know of no field of legislation in which the teaching of experience is more needed, yet more often subordinated to fancy, prejudice, and interest."

The main portion of the book consists of an admirably clear history of the reasons why control was instituted in 1915, of the successive measures of control adopted, and of the results produced by these measures. A final chapter is devoted to a consideration of the lessons which the author considers these experiences teach; various important memoranda, orders, and statistics are given in appendices.

The history of the origin of drink control shows very clearly that it was adopted at the urgent instance of the naval and military authorities as a measure necessary for the successful prosecution of the war. The difficulties of the Control Board are traced, and it is made plain that pressure was constantly being brought to bear on it to go beyond measures of simple military necessity and to strain its authority in the interests of teetotalism; the people accepted control up to a certain measure without opposition other than the grumbling which is a traditional British privilege, but when control had been carried to a certain point any further restriction aroused very keen opposition.

Considerable attention is devoted to the Carlisle scheme, its successes and disappointments. The author gives a qualified approval to the scheme; he admits that it produced a great improvement, but compares post-war figures for drunkenness in Carlisle and comparable towns, and concludes "that the special conditions of the trade in Carlisle have not produced any distinct or corresponding effect in the improvement of public order." It is not suggested that the reforms in Carlisle have produced no benefit, but the figures seem to prove that they have not reduced drunkenness. This result, which, as the author remarks, has been a surprise and a disappointment, must be taken as proof that improvements in public houses, reductions in their number, and increased facilities for the sale of food in licensed houses cannot be expected to produce any striking increase in sobriety. The debatable point is, of course, whether the figures of convictions for

[1] *Drink in 1914-1922: A Lesson in Control.* By Arthur Shadwell, M.A., M.D., LL.D., F.R.C.P. London: Longmans, Green and Co. 1923. (Demy 8vo, pp. xi + 245. 10s. 6d. net.)

drunkenness are a reliable index of the amount of undesirable drinking occurring in any society. The chief conclusions arrived at by the author are as follows:

(1) "The war proved to demonstration that, though the nation is more sober than it used to be and more sober than others, the habit of excessive drinking still prevails to such an extent as to constitute a serious national disability."

(2) "That excessive drinking can be effectively checked and the disability caused by it proportionately reduced by appropriate measures, which yet leave an amount of liberty sufficient to avoid a widespread revolt against the law or a resort to wholesale evasion."

(3) "That the principal measures contributing to this result were (1) curtailment of hours, (2) limitation of supply and diminution of strength, (3) raised prices."

(4) "That under peace conditions the volume of intemperance can be kept far below the former level by means of short hours and higher taxation, which at the same time provides an increased revenue. These measures have proved really efficacious while others—particularly state ownership and control, the reduction of licensed houses, alteration of premises, disinterested management and the supply of food—have failed to exert any appreciable influence on sobriety and public order."

Dr. Shadwell is strongly opposed to prohibition because he holds that it is impossible to enforce it in a free country for three reasons—namely, the ease with which alcoholic drink can be produced, the lucrativeness of the illicit traffic, and the refusal of society to regard drinking as a crime whatever the law may say. He holds that the experience of the United States amply supports these conclusions. He concludes that the only sound lines upon which temperance reform can advance are the education of the people to improved habits, and holds that no permanent good can come of coercion. This is a sound democratic doctrine to which everyone will be ready to subscribe as a general principle, although most persons are apt to forget it in the case of any particular reform in which they are specially interested.

What has been said will be sufficient to make it clear that Dr. Shadwell's book is unlikely to be popular with those engaged in propaganda, either for or against the drink trade. He is definitely against prohibition, but on the other hand considers it to be clearly proved that the consumption of alcohol in this country is still excessive, and that any return to pre-war conditions would be disastrous.

DISEASES OF RECTUM, ANUS, AND COLON.

WE have to record yet another attack on that most popular surgical fortress, the lower alimentary tract. This consists of a salvo of three volumes from Dr. S. G. GANT of New York City. The dominant idea in his book *Diseases of the Rectum, Anus, and Colon*[2] is to present to specialists, general practitioners, and students a complete and practical treatise of the surgery of the large bowel from the ileo-colic angle to the anus. Each subject is discussed in full detail, and the semi-diagrammatic illustrations in particular help to make the context clear. It is a pity that the index for the three volumes should appear in the third volume only. This means that for two-thirds of the work one has no index at hand, and that one must possess all or none, which is a handicap to those whose special interest is only in parts of the whole subject.

Of the treatment of haemorrhoids the author writes with conviction. He produces local anaesthesia by injecting eucaine or novocain into each pile, divides the skin round its base, ties the pile, and cuts it off. The operation is painless, is over in ten minutes, and keeps the patient in bed from one to four days afterwards. As to the method of injecting piles with carbolic acid, quinine, and urea, the writer sounds a warning note: "When the injections go wrong the patients suffer a great deal more and are confined to bed for a longer time than if they had undergone the radical operation." He quotes the cases of two patients who died as a result of this operation, one from septic pneumonia, the other from sloughing of the rectum, and knows indirectly of three others who died of embolism following the ministrations of the advertising or itinerant "pile doctors." This pessimistic view is no doubt based on the results of this type of unqualified quack, who seems to enjoy a wider range of public favour in the United States than in this country.

On the debated question of the association of fistula in ano with pulmonary tuberculosis, Dr. Gant states that not more than 5 per cent. of consumptives suffer from fistula, and that in 5,000 sinuses examined less than 10 per cent. were tuberculous.

Diverticulitis is well discussed; if the diverticula are few in number he recommends infolding or excision; if numerous or if resection is impracticable, short-circuiting or colostomy. He quotes Mayo's statement that carcinoma supervened on diverticulitis in 7 out of 27 cases, and states that he has himself had two cases in which this happened.

The kindred subjects of constipation, "obstipation," intestinal stasis, and auto-intoxication are treated at considerable length, and there is a good deal of overlapping. Obstipation is defined as a type of constipation induced by mechanical obstruction preventing normal passage of faeces through the small intestine, ileo-caecal valve, colon, rectum, and anus, and is essentially surgical. All the various "pexies and plications" are enumerated for the different kinds of visceroptosis. From the diagrams these fixations would appear ideal, but almost nothing is said about the after-results, which is the main reason for their performance. On the prevention of post-operative adhesions no new light is thrown. The treatment of malignant disease is exhaustively dealt with. The different kinds of operation and the various modifications are plainly set forth and well illustrated. Many statistics are quoted with reference to mortality and operability, and it is shown that the prognosis remains grave. The author's percentage of cures works out at about 26, and is based on an operability of 65 per cent. He quotes the cures of European surgeons as varying from 10 to 40 per cent., with an average of about 16 per cent.

The book is very comprehensive; everything which has a direct or indirect bearing on the title, whether medical or surgical, is mentioned. The arrangement is apt to be loose, and the book makes heavy reading. It would have saved a good deal of cross-reference had the whole subject of malignant disease and its operative treatment been relegated entirely to one volume. It is a little difficult to see how a special chapter should have been given to spina bifida. Nor are we enamoured with many embellishments to the nomenclature. Thus we read of appendectomy, sphincteralgia, celialgia, enteralgia, obstipation, to mention a few.

The desire to clear up the confusion in the minds both of the laity and the profession on the subject of their nature and treatment has led Mr. ARTHUR S. MORLEY to publish a small book on *Haemorrhoids*.[3] Its main theme is the value of interstitial injections of carbolic acid. Operative treatment in the author's view is rarely indicated for internal haemorrhoids. He claims that the patient treated by interstitial injections need not be confined to bed and is spared considerable pain, inconvenience, and expense. The book, though short, deals in succession with surgical anatomy; etiology and prophylaxis; pathology, symptoms, and treatment of external haemorrhoids; pathology, symptoms, and diagnosis of internal haemorrhoids; treatment of injections and its technique; the pathological effects of injection; complications, recurrence, advantages and disadvantages of injection and illustrative cases. The author states that among 3,000 cases he has had 14 of severe pain; haemorrhage followed in 0.25 per cent., and there was one case of sepsis; recurrence was observed in 16.6 per cent. after two years. Contraindications to injection are fissure and fistula, strangulated and gangrenous haemorrhoids, displacement of the uterus, enlargement of the prostate, and cirrhosis of the liver.

It is interesting to compare with this other recent publications on the same subject. Gant, in the book

[2] *Diseases of the Rectum and Colon, including the Ileocolic Angle, Appendix, Colon, Sigmoid Flexure, Rectum, Anus, Buttocks, and Sacrococcygeal Region.* In three volumes. By S. G. Gant, M.D., LL.D. Philadelphia and London: W. B. Saunders Co. 1923. (Roy. 8vo. Vol. I, pp. ix + 543; 361 figures, 6 plates. Vol. II, pp. 515; 545 figures, 2 plates. Vol. III, pp. 528; 368 figures, 1 plate. £6 6s. the set of three volumes.)

[3] *Haemorrhoids: Their Etiology, Prophylaxis and Treatment by Means of Injections.* By Arthur S. Morley, F.R.C.S. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. 1923. (Demy 8vo, pp. viii + 114; 9 figures, 1 plate. 6s. net.)

noted above, says that injections are indicated for moderate-sized and protruding varicose and capillary internal haemorrhoids, but not for large hypertrophic, inflamed, strangulated, and prolapsed haemorrhoids, nor where local complications exist. Mr. Lockhart-Mummery's opinion is that injections are convenient, and within certain limits and in selected cases the results are very good. They are useful when operation is contraindicated, but the haemorrhoids recur after short intervals. He has never seen any serious complication from injections, which, however, are contraindicated when there are more than three haemorrhoids, when they are large and prolapsed, and when there is haemorrhage or other rectal complication.

Mr. Morley is not precise enough in stating to what degree he selects his cases and the exact indications for injection. In comparing it with other operations it is to be remembered that the latter include cases which are too bad for injection.

THE LONG AND THE SHORT OF IT.

PROFESSORS CZERNY and KELLER have commenced the publication of a second edition of their immense work, *Des Kindes Ernährung, Ernährungsstörungen und Ernährungstherapie*.[4] The present volume of 688 large and closely printed pages has for its title *Ernährung des gesunden Kindes*, and its subject is the nutrition and metabolism of the infant in the first year of life. How completely and minutely the subject is dealt with is indicated by the references to the literature, whose numbers reach the terrifying figure of 1,500. The great subject of metabolism is perhaps most easily studied in the infant, where both the intake of food and the materials of excretion can be more exactly controlled and measured than at later periods of life. And yet with these simplified factors of the problem, with a single food (milk), and with the facilities for collection and measurement of the excretions which are given by the helpless infant, the patient labours of the chemical analyst have heaped up a gigantic mass of data. The aim of the authors has been to collect, arrange, and critically value this mountainous heap of data. The readers of their book may well exclaim with Gremio, "O this learning; what a thing it is!"

The earlier chapters deal with the first day of life, with the examination of the newborn child, with the questions of maternal and wet nursing and of artificial feeding which then come up, and with the physiological conditions of the infant at birth and in the succeeding days. A very full examination is then made of human milk from the earliest stage of lactation to the close, with the variations in its chemical composition and quantity; of cow's and other mammalian milks; of the derivatives of cow's milk; and lastly of the farinaceous and vegetable foods used in the first year. The details and technique of feeding by the breast and bottle are then given, with illustrative charts from many authors of the weight curves under these different types of feeding. The closing chapters deal with the chemical composition of the body as a whole, both in normal and in certain morbid conditions, and give a full account of the digestive secretions and glands, of the bacterial flora of the alimentary tract, and a complete examination of the urine and faeces.

It will be seen from this brief description that the book is an unusually complete presentation of a large and complicated subject, and that it is valuable as a work of reference rather than as a practical manual of infant feeding. For in it all the important data of the subject have been gathered together from the literature of two continents. Facts, statistics, and tables are set down in ordered ranks, and the reader himself can judge from their agreements or discrepancies to what practical conclusions they lead. The book has its value as a storehouse of physical and chemical data on the metabolism and nutrition of the infant, and a high tribute must be paid to the industry and patience of the authors. As a work of reference it suffers from the lack of an index. The list of chapter headings given is only a general guide to the contents; there are many minor points of interest and importance buried in the text, and lacking even there the indication of sectional and paragraph headings. Even a short index of subjects would greatly facilitate reference, and would increase the value and convenience of the book to special students of the subject.

The book on the diagnosis and treatment of diseases of children by Dr. F. LUST of Karlsruhe has reached its third edition.[5] It is a condensed account of the subject, and is arranged on the usual plan; it begins with a short account of the physiology of growth, proceeds to the feeding of the healthy infant, and then deals with diseases. The deliberate plan of compression has no doubt its attraction and value, and reference is facilitated by good indices. Very little is said of pathology; important symptoms are detailed in a somewhat disconnected way; but considerable care and space are devoted to treatment. Indeed, once the difficulty of diagnosis is passed, the book affords reliable and detailed guidance in treatment. The concluding section of the book includes a full pharmacopoeia with instructions for the preparation of food materials, and a list of Continental sanatoriums and health stations for sick children.

SENILITY AND REJUVENATION.

What is Man?[6] is the title of Professor J. ARTHUR THOMSON's lectures—the third course of "Thomson Lectures" he has given at Aberdeen—on the aspect of man according to biologists. In simple and pleasant language man's evolution, physical and mental, is discussed from many points of view, commencing with the pedigree of man from the primate stock, and giving descriptions of the known early types. Man's body is described as a walking museum of relics of which Wiedersheim gives a list of fifty, ontology recapitulating phylogeny. Such vestigial remains are said to be prone to disease and infection, and Professor Thomson regards man's alimentary canal as much too long and the colon as in some measure an anachronism. Following Mr. Morley Roberts's *Warfare in the Human Body*, he recognizes some hostility between the constituent parts of the body, and remarks that, although a compromise may be effected, control may be disturbed, and that such a loss of equilibrium between epithelial and connective tissue is the underlying factor in malignant disease. Old age is differentiated from senility, which is a degenerative process stated hardly ever to occur in wild nature, man and domesticated animals having almost a monopoly of this disharmony, which is a penalty for human complexity. Senility and disease are regarded as the results of man's rebellion against Nature's régime and misdeeds such as his indulgence in various forms of excess.

The volume entitled *Rejuvenation*[7] is a translation of a popular work by Dr. JEAN FRUMUSAN, which reached its fifth edition in the space of a year and a half. It has an optimistic preface from the late Jean Finot, the author of a book on the philosophy of longevity. Frumusan's book is obviously intended for the lay public and contains much sound advice about the laws of physiological righteousness. The errors common in ordinary life, such as fear of light and fresh air, and excesses in diet, drink, and tobacco, are emphasized, and the view that there is any real correlation between the dated age and the age value of an individual is contested. Premature old age indeed is described as the climax of a series of excesses and of sins of omission. The treatment recommended to ensure rejuvenation aims at establishing a new functional equilibrium; for this purpose depuration, it is said, is almost always necessary to remove the extensive auto-intoxication present in premature old age; a form of intoxication stated to be much commoner than is generally believed, is that due to taking medicines.

[4] *Des Kindes Ernährung, Ernährungsstörungen und Ernährungstherapie.* Von Professor Ad. Czerny und Professor A. Keller. Zweite vollkommen umgearbeitete auflage. I Band. I Teil. Leipzig und Wien: Franz Deuticke. 1923. (Sup. roy. 8vo, pp. 688; 84 figures.)

[5] *Diagnostik und Therapie der Kinderkrankheiten: mit speziellen Arzneiverordnungen für das Kindesalter.* Von Professor Dr. F. Lust, Direktor des Kinderkrankenhauses in Karlsruhe. Dritte auflage. Berlin: Urban und Schwarzenberg. 1923. (Med. 8vo, pp. vii + 465.)

[6] *What is Man?* By J. Arthur Thomson, M.A., LL.D. London: Methuen and Co. 1923. (Cr. 8vo, pp. ix+244. 6s. 6d. net.)

[7] *Rejuvenation: The Duty, the Possibility, and the Means of Regaining Youth.* By Dr. Jean Frumusan, with a preface by Jean Finot. Translated from the fifth French edition by Elaine A. Wood. Sixth edition. London: John Bale, Sons, and Danielsson. 1923. (Cr. 8vo, pp. viii + 128. 7s. 6d. net, postage inland 6d.)

Fasting, radiant heat, massage, and exercise are advocated, and attention is drawn to what some may regard as a paradox—namely, that the more we eat the less we assimilate and the more we suffer from fatigue. Ultra-violet rays are regarded as the sovereign remedy for high blood pressure, and stress is laid on the value of light and electricity in the cure. Treatment by endocrine extracts or operations on the lines of Steinach and Voronoff are not discussed in this volume. The translation suffers from want of supervision from someone conversant with medical terms, as is shown in the sentence about the heart: "its rhythm is distracted by the toxicated nervous centres and considerably inconvenienced by the dilation of the tomacal dome surrounding its point."

GUY'S HOSPITAL REPORTS.

THE concluding quarterly number of this year's volume of the *Guy's Hospital Reports*[8] has a sympathetic notice of the late Sir George Savage by Dr. R. Percy Smith, which is reprinted from the October number of the *Journal of Mental Science* for 1921; it is illustrated by two portraits of this genial psychiatrist, who for thirty years found one of the joys of his life in teaching the students of Guy's Hospital. Of the two papers dealing with rheumatism and tonsillectomy, that by Drs. G. H. Hunt and A. A. Osman shows that enucleation of the tonsils is not a certain preventive of a recurrence of acute rheumatism; indeed, in this series recurrences were actually more frequent in the patients submitted to operation. Many factors must be taken into account in considering tonsillectomy in rheumatic children, and it would seem quite unjustifiable to perform this operation on rheumatic children whose tonsils and lymphatic glands appear to be healthy. The writers also conclude that, although the tonsils may be the primary focus or portal of entry in the first attack, the virus may persist in some other part of the body, such as the heart. From observations extending over four years of tonsillar infection in cardio-vascular diseases Dr. H. J. Starling of Norwich is convinced that the tonsils are the portal and focus of rheumatic infection, that the presence of enlarged glands under the jaw is a more certain proof of tonsillar infections than the appearance of the tonsils, and that enucleation of the tonsils, which should be absolutely completed, as a small remnant may be as effective as the whole tonsil, is a most valuable preventive measure. But he says that, as rheumatic infection is largely influenced by conditions of climate and soil, it is not surprising that a child on returning to the environment of the original rheumatic attack should relapse in spite of tonsillectomy. It is suggested that acute rheumatism and chorea are due to the spread of tonsillar infection by the blood stream, and that rheumatoid arthritis is the result of intestinal infection of tonsillar origin. In a thoughtful paper on cardiac murmurs and their causation, Dr. J. M. Gill, senior physician of the Sydney Hospital, describes a case of auricular fibrillation with a presystolic murmur, and states his opinion that in thoracic aneurysm no murmur of any kind is audible unless the aortic valves are incompetent. He argues that in auricular fibrillation the striated muscular tissue of the auricle is completely paralysed, and that then the unstriped muscular tissue acts unchecked.

Dr. F. A. Knott, writing, under the inspiration of Dr. Hurst, on the gastric germicidal barrier, brings forward experiments to prove that clinical conditions arising from intestinal infection and absorption of their toxins may often be due to deficiency, temporary or permanent, of the hydrochloric acid in the gastric secretion, and that this should be remedied by the oral administration of this acid, alone and not mixed with proteins, such as those in milk, which immediately remove some or all of its germicidal power.

An article "On some cases from 'Clinical'" is prefaced by a note on the history of these wards, to which specially interesting medical cases have long been sent; among the cases reported are three of leather-bottle stomach, due to diffuse carcinoma, with the characteristic *x*-ray appearances of a high, small stomach and a rigid open pylorus which accounts for the rapid emptying of a stomach devoid of any peristaltic power. The factors in the prevention of the operative mortality in exophthalmic goitre are lucidly set forth by Mr. E. G. Slesinger. In a well reasoned discussion of the causation of cataract, Mr. A. W. Ormond leads up to the conclusion that noxious agents, such as an enzyme, are able from the failure of the protective function of the capsule to reach and hydrolyse the lens fibres. The number contains the index to the volume.

[8] *Guy's Hospital Reports*, vol. lxxiii (vol. iii, fourth series), No. 4, October, 1923. Edited by A. F. Hurst, M.D. London: Henry Frowde, and Hodder and Stoughton. 1923. (Roy. 8vo, pp. 371—489; 1 plate, 21 figures. Subscription £2 2s. for volume of four numbers. Single numbers, 12s. 6d. each.)

MAKERS OF SCIENCE.

IN *Makers of Science—Mathematics, Physics, Astronomy* Mr. IVOR B. HART traces the progress of physical and mathematical science from the earliest times to Albert Einstein's theory of relativity. Dr. C. Singer, in an interesting introduction, says that in recent years the history of science, which still needs expansion and completion, has begun to displace though not entirely to take the place of the old classical education. There are, as he points out, two possible channels by which the history of science may be taught: one through science, which demands greater knowledge from its students; the other the biographical method, which in the earlier stage is probably the best and most attractive.

The book is not a series of detached biographies, for the pioneers named have been chosen rather from their suitability as pegs on which to hang the scientific events of their times than from any superiority over their contemporaries. William Gilbert (1544-1603), the father of magnetic philosophy, and Galileo Galilei of Pisa, the founder of modern physics, were the two outstanding pioneers in the revolution of the scientific method in the sixteenth century. Gilbert was President of the Royal College of Physicians in 1600 and a Court physician, dying in the same year as Queen Elizabeth, as if, in Thomas Fuller's words, such was his loyalty to the Queen, he was unwilling to survive her. The middle of the seventeenth century saw the final overthrow of the Aristotelian tradition under Sir Isaac Newton's leadership. The notice of Robert Boyle, who it is said became a life-long stutterer by imitation early in life, contains an account of the origin of the Royal Society by the *virtuosi*, as Boyle called the first members. He is said to have feared death only because he would then know all things and so no longer have the delight of making experiments. The remainder of this pleasantly written and admirably illustrated handbook deals mainly with magnetism and electricity as exemplified in the work of Ampère, Davy, Ohm, Faraday, Kelvin, and Einstein.

THE ROMANCE OF MEDICAL MISSIONS.

THERE has been published under a most prosaic title a charming little volume of letters by medical missionaries in various parts of the world—Africa, India, and China. The book can be read through leisurely in an afternoon, but the reader may be warned that whoever begins will want to finish it.

Perhaps the title, *Medical Practice in Africa and the East*,[10] may have been intended to prevent suspicion that the contributors, being missionaries as well as doctors, might be foisting on the public something goody-goody. The book is all good, but none of it is goody, whilst its high moral tone, and the sympathetic introduction by Mr. Stephen Paget, enhance its value. In brief it gives a vivid picture of medical practice among native races, often in remote areas where consultation or qualified assistance is unobtainable, and where equipment is elementary or incomplete, so that initiative and improvisation

[9] *Makers of Science—Mathematics, Physics, Astronomy.* By Ivor B. Hart, with an introduction by Dr. Charles Singer. London: Oxford University Press (Humphrey Milford). 1923. (Cr. 8vo, pp. 320; 124 figures. 6s.)

[10] *Medical Practice in Africa and the East.* Being a series of open letters on professional subjects from doctors practising abroad, addressed to their colleagues at home. Edited by H. Martin, M.A., and H. H. Weir, M.A., M.B., with an introduction by Stephen Paget, F.R.C.S. London: The Student Christian Movement, 32, Russell Square, W.C.1. 1923. (Cr. 8vo, pp. xiii + 111. 4s. net.; paper 2s. 6d. net.)

have full scope, whilst responsibilities have to be undertaken which would be quite unjustifiable at home. Such a life may repel some, but should attract others, just as practice does in the remote parts of the highlands and islands of Scotland. Part of the object of the book, indeed, as we read it, is to call attention to the fields of work which exist for active, enterprising, and competent young doctors of both sexes, who may be mapping out their own careers. Mr. Paget, while agreeing with one of the contributors who writes, "There is plenty of room for mediocre doctors in the home country, let them stay there," yet argues that many a student at the London School of Medicine for Women may hardly attain a great practice here yet might do very well in Africa or China, where there is a certainty of any amount of work being obtained, though the life will have hardships which have to be accepted as well. The work is not that of medicine alone; the teaching of religion is an essential part of it, but contentious details of doctrine and ritual are clearly outside its sphere, and the broad fundamental truths of Christianity can be inculcated also by the influence of the practitioner's own life and conduct.

The essays vary in their contents. They deal not only with surgery, medicine, and midwifery, but with leprosy and scientific research, hospitals, and tropical diseases. One contribution gives an instructive and illuminating account of medical education in China, explaining the difficulties of language, and of translating English into the Chinese script for the use of native students; the developments which have taken place since the Boxer rising in 1900 are noted, and there is a comprehensive survey of the educational situation in 1913; last and most important of all, the entrance of the Rockefeller Foundation into the field is related. It is recalled that the "sublimely simple direction" given to the trust was, "to be used for the service of mankind."

Space forbids even the mention of many of the good things contained in the little volume, but no doctor or layman will ever regret having spent four shillings on its purchase.

NOTES ON BOOKS.

AN excellent little book on *Elementary Hygiene*[11] has reached us from Lahore. The authors are Mr. BIHARI LAL BHATIA, the lecturer on zoology at the Government College, and Dr. PREM NATH SURI, assistant surgeon at King Edward's Medical School in that city. It has been written to meet the requirements of the matriculation students in the Punjab and other parts of India, where the subject of elementary hygiene is studied alongside a course in physiology. The authors hope to awaken the student's curiosity and enable him to take an intelligent interest in the reasons on which the rules of hygiene are based. In this respect the little book admirably fulfils its purpose. It is written in clear English, but with full appreciation of the Indian point of view. There is no attempt at suggesting radical changes in Indian domestic life, except where the authors, with full knowledge of existing conditions, are convinced of the utility and practicability of their recommendations. They desire, however, to add something to the cause of sanitary reform in India, and have already had much experience in popularizing elementary hygiene by lantern lectures and classes held in connexion with the Society for Promoting Scientific Knowledge. We have nothing but praise for a work of this kind. The chapters touch practically on the whole field of hygiene, and give a brief but simple and sufficient elementary account of the scientific facts on which practical sanitation, in connexion with disease, ventilation, water supply, food, personal and domestic hygiene, disposal of waste products, disinfection, rural sanitation, and so on, is based. As a school book on elementary hygiene the volume is of general value and not necessarily limited to Indian requirements only.

Mr. J. B. PARFITT'S *Operative Dental Surgery* has reached a second edition,[12] and we are glad once more to be able to praise the book. It is essentially one for the everyday dentist. It deals (and deals well and lucidly) with scaling, filling of teeth, treatment of septic roots, crowns, tooth extraction, and the use of local injection anaesthetics. We note that the author expresses himself in a rather guarded manner on the subject of retaining teeth whose root canals have been once septic. He gives the impression of being inclined to wait and see rather than anticipate trouble by timely (or untimely) extraction. He does not appear enthusiastic about the possibilities of ionic medication, in regard to which he remarks, "another treatment applied to septic apical foci is ionization, which sometimes gives good results." Among many well chosen illustrations is a stereoscopic picture of the pulps of two molars which anyone used to squinting at stereoscopic *x*-ray negatives can readily bring out into bold stereoscopic relief. Mr. Parfitt writes clearly, and no dentist will repent the time spent in reading this book. Perhaps he will be inclined to agree with us that we would like more about extraction and better *x*-ray illustrations.

Last year the Board of Education issued a syllabus of lessons for use in schools, and notes for the assistance of teachers under the title of *The Hygiene of Food and Drink*. It excited much thoughtful interest amongst school authorities, and stimulated teaching in the schools. The action of the Board has been appreciated also by medical practitioners, as witness a memorial sent recently by the Council of the Metropolitan Counties Branch of the British Medical Association to the Board of Education, urging that the teaching of hygiene to students in colleges should be undertaken by medical practitioners. The Temperance Collegiate Association has now issued a small hand-book which is a running commentary upon the pamphlet of the Board of Education. The book is entitled *Physical Fitness*,[13] and covers three sections: for children under 12 years of age, between 12 and 14, and a senior course, the last by Dr. Courtenay Weeks. The book is clearly written, with numerous small illustrations. The book is part of a memorial to Professor Sims Woodhead of Cambridge.

ELLIS'S *Practical Bacteriology*[14] is intended primarily for the use of chemical students, to whom many avenues of research are closed if there is a lack of knowledge of the elementary principles of that subject. As an example, the changes in the acidity of a fluid caused by micro-organisms may be mentioned. The nature of the microbial flora in a given medium is largely dependent on the degree of acidity, and as the nature of the end-products varies with the kind of micro-organism predominant in the fluid it is evident that many industrial processes may be accelerated or retarded by exercising control over the development of acidity. The book sets out with a description of procedures of general application, such as sterilization, the preparation of nutrient media, and staining. In connexion with these subjects details are given of the apparatus needed, with directions and precautions as to their use. The author next describes the line of investigation to be adopted in the study of a particular species of bacterium, the points to be noted in the various kinds of cultures, the bacterial colonies, and so forth. The final chapters are devoted to special subjects—namely, the examination of drinking water, sewage and sewage effluents, yeasts and moulds. The book has the advantage of being small; it is eminently practical, complete, and gives the rudiments of the subject, which are apt to be slurred over by the student with the result that the whole of his subsequent work is liable to be defective. Although designed for chemical students it would furnish a good foundation in bacteriology for medical students as well, since it contains nothing that a medical student is not required to be acquainted with.

Professors UHLENHUTH and DOLD have issued a second edition of their book on practical hygiene,[15] the first edition of which was published in 1914 from the University of Strasbourg. The new edition, as a result of the war, comes from the Universities of Freiburg and Marburg. The book is essentially a laboratory handbook. It is written for instructional as well as for practical use, and consists entirely of chapters descriptive of the physical, chemical, and bacteriological analyses of soil, water, food supplies, and beverages of every description and their adulteration; clothing, air and ventilation, are dealt with also, and there is a chapter on the estimation of lighting in dwellings. The work should prove a useful handbook in an hygienic laboratory. It is well printed, and the subject-matter is admirably arranged and illustrated.

[11] *Elementary Hygiene.* By Bihari Lal Bhatia, M.Sc., F.Z.S., and Prem Nath Suri, M.B., B.S. London, Calcutta, New York: Longmans, Green, and Co. 1923. (Cr. 8vo, pp. 241; 31 figures. 2s. 6d.)

[12] *Operative Dental Surgery.* By J. B. Parfitt, M.R.C.S., L.R.C.P., L.D.S. Second edition. London: Edward Arnold and Co. 1923. (Demy 8vo, pp. 342; numerous illustrations. 21s. net.)

[13] *Physical Fitness.* London: The Union Publishing House, 59, Old Bailey. (Pp. 100.)

[14] *Practical Bacteriology for Chemical Students.* By D. Ellis, Ph.D., D.Sc., F.R.S.E. London and New York: Longmans, Green, and Co. 1923. (Cr. 8vo, pp. viii + 13; 25 figures. 4s. 6d. net.)

[15] *Hygienisches Praktikum (Practical Hygiene).* By Dr. Paul Uhlenhuth and Dr. Herman Dold. Second edition. Berlin and Vienna: Urban and Schwarzenburg. 1923. (Cr. 8vo, pp. viii + 268; 85 figures. Fr. 6 Swiss.)

CARE AND EDUCATION OF THE BLIND.

Two reports of work undertaken for the welfare of the blind have come to hand covering much the same period of the year 1922-23. The one is the fourth annual report of the Advisory Committee on the Welfare of the Blind,[1] and the other the annual report of the National Institute for the Blind.[2] The Advisory Committee consists of a chairman and vice-chairman appointed by the Minister of Health, representatives of the County Councils Association, of the London County Council, of the Associations of Municipal Corporations and of Poor Law Unions, and of voluntary agencies for the blind. It is a really working committee which collects information on the doings of the statutory authorities, advises them on their duties, seeks to co-ordinate effort, and reports to the Minister; its expenditure for the year was £192, including the cost of the publication of its report.

Progress is being made in the application of the provisions of the Blind Persons Act, and the number of pensioners rose from 9,107 to 9,921. These pensions are a boon to the aged blind, and release voluntary funds for other purposes; but some hardships have arisen owing to local authorities withdrawing aid previously given to aged blind, so that on balance they were worse off. It is hoped that this may be remedied. It had been feared that the introduction of rate-aided services might adversely affect voluntary contributions to funds for the blind, but so far this has not happened; since the passing of the Act new voluntary agencies have been formed and existing ones extended. This may be due partly to the wise method of the Ministry and the local authorities in acting so far as is possible through the existing voluntary agencies. It is considered that co-operation among superintendents of workshops for the blind would lead to economy, and that the uniform system of account keeping prescribed by the Ministry should be adopted; a uniform system of costing is advocated. The necessity for these measures is shown by the inequality of the maintenance charges at various institutions.

In Germany there are 33,000 blind (on a stricter definition) as compared with 35,000 in England and Wales; 3,000 in Germany owe their blindness to the war, as against 1,600 here. Many of the blind are in residential workshops in Germany, a provision rare here. The work done is almost identical, but in Germany some 450 are employed in ordinary factories or workshops. Attempts are being made to introduce the more skilled of the blind into ordinary workshops here also, especially those whose blindness is due to industrial accidents. In France the majority of the blind workers are home workers; only 600 are in institutions for the blind, and 21 in ordinary factories. There are in several areas local centres that buy and sell for the home workers.

The blind beggar still exists, despite all the provision made for him. Some cities have suppressed the blind beggar, but he has generally fled to the next city. The need for general action is pointed out. The report adds:

> "We venture to suggest that the public have the matter very largely in their own hands, as by their generosity to the blind of this class they make it extremely difficult for local authorities and voluntary agencies to persuade blind beggars to accept the provision made for the blind generally rather than appeal for alms in the street."

The evil influence of the easy gains of the lazy and idle upon the minds of the industrious renders indiscriminate charity reprehensible. Attention is drawn to the necessity for the proper examination of those claiming to be blind before they are admitted into workshops for the blind.

> "It is believed that there are in workshops and elsewhere a number of persons in respect of whom grant is being paid by the Ministry who are not properly blind within the definition of the Regulations governing grants in aid of the welfare of the blind and the Blind Persons Act, and it has been suggested to us that it would be desirable for the Ministry in consultation with the oculists of agencies to satisfy themselves on this point before further grant is paid."

The report of the work of the National Institute for the Blind is a record of work of which any society may well be proud. There is scarcely any aspect of the life of the blind in which it is not a ready and energetic assistant. One part only of its many-sided work would be sufficient to justify its existence, and that is its publications department. The institute is the general printer to the blind of these islands, and of the Empire, and to some extent of countries outside our commonwealth. The eleven periodicals it issues in Braille and Moon type had a circulation of well over 200,000 in the past year. It printed also some 15,000 books and pamphlets in Braille and a third as many in Moon type. These books are issued at one-third cost to the blind of these islands, at half cost to the Dominions, and at cost to foreign countries. The loss on these publications, to be made up out of the general funds, was £8,169 for the year. Of no less importance is the manuscript department. The institute has a staff of 150 voluntary workers, experts in transcribing Braille, who are prepared at short notice to produce in the type they can read any book required by the blind for advanced study. The demand for these transcripts is so great, especially from teachers of the blind, that the production of light literature has been stopped. Two thousand volumes are now in hand; they include some of the best of our literature in history, science, and law; 875 volumes were produced last year, one worker transcribing thirty volumes.

Another fine piece of work done by the institute was the establishment of the College for Blind Girls at Chorley Wood in 1921. The number of students therein is steadily increasing. Until the full complement of pupils is attained the cost is greater than can be met by the fees of pupils, so that the excess falls upon the general funds of the institute. The King and Queen have approved and recognized the objects of the college by a generous donation. The college is a typical public school for girls; its standards are those of the best known of these schools. Its habitation and equipment are as perfect as well could be. The head mistress is a lady whose previous work at Girton and Roedean is proof of her educational sufficiency. Medical men can do no greater service to this college and to those of their acquaintances or their charges who are blind or nearly blind than by putting the two into communication. The advantage to a blind girl of receiving a full education with a number of her compeers both in ability and disability cannot be overestimated.

The Sunshine Homes for Blind Babies are too well known to need more than a note that the northern home is now ready for occupation, and in it some thirty children will be received. Less conspicuous but no less necessary departments are those for the training of the blind in massage, for the relief of the necessitous blind, for after-care, for home teaching and the training of home teachers, and the provision of homes for some of the older blind. The statement of accounts shows that the expenditure for the year was just over £200,000; and there is here the only blot on the report, for a deficit of £43,268 has to be carried forward for the next year. Here is an opportunity to introduce grateful patients to a valuable mode of expression of their gratitude for their own recovery.

[1] Fourth Annual Report of the Advisory Committee on the Welfare of the Blind to the Minister of Health, 1922-23. London: H.M. Stationery Office. 1923. Pp. 20. Price 6d. net.

[2] National Institute for the Blind, Annual Report, 1922-23. Headquarters, 224, Great Portland Street, London, W.1.

THE second International Congress of Urology will be held in Rome from April 23rd to the 26th, 1924, under the presidency of Professor Alessandri, when the following subjects will be discussed: (1) Renal innervation, introduced by Ambard of Strasbourg and Soja of Pavia. (2) Vaccine treatment in urinary diseases, introduced by Rovsing and Wulf of Copenhagen, Dudgeon of London, Noguès of Paris, and Pirondine of Rome. (3) Remote results of operation for renal calculus, introduced by Brongensma of Amsterdam, Cifvental of Madrid, and Tardo of Palermo. (4) Recent progress in urology: (*a*) pathogenesis of hydronephrosis, introduced by Hinman of San Francisco; (*b*) vesiculotomy and transvesical vesiculectomy, introduced by Sir John Thomson-Walker; (*c*) vesical malacoplasia, introduced by Barrington of London. Further information can be obtained from the secretary, Dr. Bonamone, 124, Via dei Gracchi, Rome.

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THE ENDOWMENT OF MATURITY.

THE new policy of the Royal Society may fairly be called the endowment of maturity; there is no reason to quarrel with it on that account. The Society exists, as William, Viscount Brouncker, its first president, said in accepting the charter granted by Charles II, "for improving natural knowledge," and no body more competent to decide how funds can best be applied to this end could be found than the Council of the Royal Society, upon which experts in all departments of science sit.

The policy was stated and explained by the President in the anniversary address, a report of which was published last week (p. 1113). The Society has been able for a good many years past to make certain annual payments from sums which it receives, chiefly from the Donation Fund and the Government grant. These have been used mainly to assist workers of promise in the early period of their career by providing the cost of apparatus and material, through research studentships, and by the Sorby Fellowship. In recent years the Society has come into the enjoyment of certain bequests and gifts—the Foulerton gift and bequest, yielding £5,050 a year, the Messel Fund, yielding £1,575, and the Yarrow Fund, £5,450. Still more recently the death of Dr. Ludwig Mond's widow has liberated his bequest, which, it is anticipated, will yield an annual income of about £2,500. These new sources of income have placed upon the Society the responsibility of determining the best way of expending them. The policy it has now adopted is interesting from several points of view. It has decided that the income may best be spent in creating greater opportunities for experienced investigators of already proved first-rate capacity in research. Such men as a rule have hitherto occupied positions in universities or other institutions which require from them manifold duties. In almost all such institutions they must give up much of their time to teaching, and there are many other calls upon them of an administrative kind, and such calls are likely to increase rather than diminish. Thus they are taken away from research, the field of work in which their capacity has been proved. The Society has deliberately inverted the order of precedence of professorial functions; it has placed its new professors in a position to regard research as their primary duty, and thereby has sought to recognize research as a definite profession, and to advance and to maintain the principle that the labourer is worthy of his hire no less when engaged in research than when he is employed in class instruction.

The need for a definite systematized policy was made the more urgent by the munificent gift of Sir Alfred Yarrow to the Society early this year. In his letter of last February announcing his gift Sir Alfred Yarrow said that he would prefer that the money should "be used to aid scientific workers by adequate payment, and by the supply of apparatus or other facilities, rather than to erect costly buildings, because large sums of money are sometimes spent on buildings without adequate endowment, and the investigators are embarrassed by financial anxieties." In arriving at its new policy the Council of the Society has been advised by a committee of which the donor is a member, so that there can be no doubt that it commends itself to him.

The first indication of the new policy was afforded just a year ago when Dr. E. H. Starling was appointed Foulerton Professor. Down to that time he had held the Jodrell chair of physiology in University College, London, and in that capacity his primary duty was to teach undergraduate students. The series of brilliant researches by which he has laid physiology and medicine under so heavy a debt were, strictly speaking, secondary. At the same time let us recognize that he could not have been so good a teacher of physiology had he not himself been, through all the years of his teaching, an active research worker. He is continuing to work in the Physiological Institute at University College, which was brought into existence mainly through his exertions, and will remain a permanent memorial of the trust his character and achievements have inspired. The two Yarrow professors—the one, Professor Fowler of the Royal College of Science, South Kensington, distinguished for his research in spectroscopy and astrophysics, and the other, Mr. G. I. Taylor of Cambridge, whose contributions to the mathematical theory of hydrodynamics and to the physics of crystals are recognized to be of the greatest originality and importance—will both, like Professor Starling, continue their researches in the laboratories of whose traditions, as the President said, their reputations are already a part.

The policy the Royal Society has adopted to guide it in the administration of the funds that have recently come under its control may therefore be regarded as presenting two closely related but slightly different aspects. In the first place it recognizes that certain professors should be relieved from the duty of teaching in order to devote themselves entirely to researches in which they have already gained distinction; in the second place it establishes the principle that a man of suitable temperament and abilities should be able to look upon pure research as a definite calling or profession in itself, which holds out to him a prospect that in the full maturity of his powers he may be placed in a position to give all his energies to following up the line of scientific inquiry in which he has already achieved success. It is a serious adaptation of Disraeli's rather cynical epigram that nothing succeeds like success.

OESTRUS, OVULATION, AND MENSTRUATION.

IN spite of an accumulation of observations and hypotheses, the very diversity of opinion expressed on the relationship of ovulation to menstruation proclaims our ignorance of this elusive problem. Its interest is not merely academic, nor is its practical importance appreciated only by breeders of stock; every scientific gynaecologist will admit the limitations of our knowledge concerning sterility in women, the functions of the corpus luteum, and the significance of menstruation, normal and abnormal. Clinical and *post-mortem* data have hitherto afforded conflicting evidence, and observations on animals have failed to elucidate the matter, inasmuch as the outstanding peculiarity of the human female finds no exact and certain counterpart in the lower species. The trend of recent work, which is summarized by G. W. Corner in an able

review,[1] suggests that the ovum is discharged by the Graafian follicle ten or fifteen days before the onset of menstruation. This idea would explain many features of the primate cycle, but it must be admitted that it presents many difficulties. For instance, Siegel[2] has adduced statistical evidence which appears to show that the human female is fertile at all times of the cycle except possibly during the last week of the intermenstrual period.

It is therefore with very considerable interest that we note the results of certain definite experiments recently published by F. H. A. Marshall and W. A. Wood.[3] Dr. Marshall is the author of that invaluable source of information *The Physiology of Reproduction*, and his work demands the greatest attention. It may be explained that the terminology originally proposed by Walter Heape is generally adopted. Thus the "anoestrum" is the period of sexual quiescence; the "prooestrum" is the period of "coming on heat"; and the "oestrus" is the period of desire. The periods of prooestrum and oestrus are commonly referred to together as the "heat" period. Heape regarded the prooestrum, and not the entire "heat" period, in animals as the physiological homologue of menstruation in women.

The experiments of Marshall and Wood consisted in the cauterization, shortly before a "heat" period fell due, of all Graafian follicles visible on the surface of the ovaries of bitches. This destruction of the follicles was found to abolish that particular period, and also to determine a prolonged anoestrum extending over the duration of two or more oestrous cycles. "Heat" subsequently reappeared, however, indicating the ultimate resumption of normal function and also that the uterus had not undergone atrophy. A mere pricking or cutting of the follicles without actual destruction failed to postpone the period of "heat." The authors conclude that prooestrum and oestrus are due to an internal secretion of the ovary produced by the follicles during the pre-inseminal stage of development. This is distinct from the secretion responsible for uterine and mammary hypertrophy during pregnancy, which, in common with the majority of other observers, they assume to be produced by the corpus luteum. They also refer to an ovarian internal secretion which is responsible for maintaining the normal nutrition of the uterus; this they believe to be produced by the smaller follicles or by the interstitial cells. These conclusions in their entirety are possibly somewhat far-reaching on the basis of the actual experimental results, but the latter are obviously worthy of respect. Some further observations quoted in support of the theory are interesting if not conclusive. A condition of nymphomania has been described in cows and heifers in which the animals appear to remain continuously "on heat," and in which the larger Graafian follicles are found to have become cystic. Irradiation of the ovaries by x rays, which, as is well known, occasions temporary amenorrhoea, has been found to cause degeneration of the follicles, whereas the interstitial cells may even hypertrophy. The normal nutrition of the uterus of the rabbit has been preserved by ovarian grafts in which the follicle cells had degenerated, and, of the possible secretory elements, only the interstitial cells remained.

It is difficult to reconcile with various human observations the authors' contention that the corpus luteum inhibits rather than stimulates "heat," if we are to regard that condition as being in some degree the homologue of menstruation. This and many other points serve to emphasize the need for collaboration between the gynaecologist, the comparative physiologist, and the veterinary surgeon. A further review which Dr. Marshall has recently published of the internal secretions of the reproductive organs[4] is of the utmost interest, and may even serve to remind the most dogmatic clinician of the deficiencies in his knowledge.

[1] G. W. Corner, *Physiological Reviews*, iii, p. 457, 1923.
[2] Siegel, *Zentralbl. f. Gynäk.*, xliv, p. 984, 1921.
[3] F. H. A. Marshall, F.R.S., and W. A. Wood, F.R.C.V.S., *Journal of Physiology*, lviii, p. 74, 1923.

CANCER AND HEREDITY.

THE determination of the part played by heredity in cancer presents peculiar difficulties. One is due to the fact that the main incidence is at a time of life later than the usual reproductive period, so that the natural elimination of the morbid strain, which usually occurs with hereditary deleterious factors, would be inoperative in the case of cancer. Furthermore, it renders it very difficult to collect complete statistical information of the incidence of the disease in the families of cancerous patients, and this difficulty is increased by the rarity of autopsies and unsatisfactory systems of death certification. Similar difficulties attach to the study of the question in animals, but the problem has been attacked from this side by Maud Slye[5] in America. During the past twelve years she has made *post-mortem* examinations on more than 40,000 mice, all descendants of a limited and carefully selected stock, bred together according to definite plans designed to give evidence as to the influence of heredity on the incidence of spontaneous tumours. Every effort is directed to the one object of permitting each mouse to reach a maximum age, and long experience and great care have made it possible to limit to a large extent the epidemic infections that constantly threaten such large colonies of mice. All mice that die, whether evidently cancerous or not, are submitted to necropsy, and sections of all lesions that might be cancerous or concerning which there is any doubt whatever—for example, every pneumonic lung—are examined microscopically. In this way more than 5,000 spontaneous tumours, mostly malignant, have been found, and the results have been summarized by H. Gideon Wells[6] in a recent paper on the influence of heredity on the occurrence of cancer. These experiments indicate that cancer in mice appears in most of the forms seen in man, and in far greater variety than had previously been supposed. Strains were established in which, among many hundreds of individuals through twenty-five or thirty generations, not a single case of tumour growth has been seen, while other strains have been obtained with figures approaching 100 per cent. tumour incidence for several generations. Not only is the incidence of cancer influenced by heredity, but also its site and its character. For example, in some strains sarcoma is very common; in others it is found rarely or never. In some strains any form of malignancy other than mammary cancer is seldom seen. In another strain there have been more than a hundred primary liver tumours, while in all the other mice examined in Slye's laboratory not a single liver tumour has been found, and only two have been reported from other laboratories. Another strain has yielded a considerable number of tumours of the testis although not a single case has ever been reported from elsewhere. The resistance to cancer in these mice behaves in breeding, in Slye's experience, like a typical Mendelian dominant character. The susceptibility behaves as a Mendelian recessive. In spite of Wells's assertion that human statistical evidence is not

[4] F. H. A. Marshall, F.R.S., *Physiological Reviews*, iii, p. 335, 1923.
[5] *Journal of Cancer Research*, 7, 107, 1922.
[6] *Journ. Amer. Med. Assoc.*, 81, 1017 and 1103, 1923.

sufficient accuracy or extent to render it of any value in the study of this subject, the problem has been attacked in an ingenious manner by Wassink and Wassink-van-Raamsdonk.[7] Starting from Slye's observation of the organ heredity of cancer in mice they interrogated over 1,000 cancer patients as to the cause of death of their relatives without inquiring specifically for cases of cancer. Among the families of 258 cases of cancer of the breast they found 102 cases of cancer, of which 40 were mammary cases. Taking the number of cases of cancer of the stomach in men —namely, 21—as a basis, and comparing the figures with the general death statistics, they find that the number of cases of mammary cancer in the families of their mammary cancer patients is eight times the figure that would be expected. The authors recognize that patients suffering from cancer in a particular organ would be more likely to remember other cases of disease in the same organ than in other organs in members of their families. In order to correct this error they take Bashford's estimate that one case of cancer may be expected in every two families, and assume that there are no cases of breast cancer among the unreported cases in their series. With this correction the figure is five times what would be expected from the general death figures. Similar evidence of organ heredity was found in cancer of the uterus, skin, lip, and tongue, but was lacking in mouth and throat cancer. This they attribute to the influence of tobacco and alcohol, though it is difficult to see why similar influences should not affect the figures for the lip and tongue. The numbers, however, are much smaller for the last four sites than for the breast, uterus, and skin. A wider application of this method of investigation should give results of considerable value.

AN ANTIMOSQUITO CAMPAIGN IN HAMPSHIRE.

AT the meeting of the War Section of the Royal Society of Medicine on December 10th Surgeon Commander G. O. M. Dickenson gave an account, based on a report by Surgeon Commander D. H. C. Given, at present abroad, of the measures taken to abate the mosquito nuisance in the Alverstoke district of South Hampshire. The nuisance has been known in the district for many years, and was mentioned in diaries half a century old, but there is evidence that it has become much greater of recent years, and is even likely to produce serious economic disturbance. The district, which comprises Browndon Camp and Stokes Bay, is low-lying, and during the spring tides the sea water percolates upwards through the shingle and forms pools which remain for a week or more. The area is also indented by creeks running inland from Portsmouth Harbour. The reasons why the nuisance has lately increased are considered to be that the camp moats are being dammed back by mud brought down by the river Alver; that the river, owing to silting, does not drain the land effectively and has been diverted by the construction of a railway embankment, whereby the original channel was left as a sort of lagoon, which became a prolific breeding ground. When Surgeon Commander Given commenced operations last March he obtained the help of Mr. J. G. Marshall, F.E.S., director of a mosquito control committee on Hayling Island near by, and it was established that the culprit was *Ochlerotatus detritus*, or salt-water mosquito, a species widely distributed around the coasts of Europe, from Denmark to Macedonia, and closely allied to the species infesting the coasts of North America. It breeds by preference in brackish or salt water, and "sows" its eggs extensively over the ground from April to October, and passes the winter in the egg or larval stage. The larvae are consumed by shrimps and small fish, and on this account are not found in the moats. The operations against the mosquito were carried out by a staff of army and navy men. The water level of the moats was reduced by two feet, the outlying pools were sprayed in the spring and early summer with oil and larvicide, and later, to ensure destruction of the eggs, shale oil or fuel oil was applied and lighted so as to form a barrage of fire; over the marshes specially made rakes were used to upturn the light and peaty soil, shallows were pumped out wherever possible and filled with shingle, and the ponds stocked with sticklebacks and shrimps, or with eels, which can live in a stagnant ditch or even in mud for long periods. There had been a marked diminution in the number of mosquitos during the summer, though there was some doubt whether this was due to the measures taken or to the fact that the season was unfavourable for breeding; Surgeon Commander Given's view was that the season was not unfavourable. In the ensuing discussion Lieut.-Colonel W. P. Macarthur expressed a doubt whether the species named was the only one concerned. He would have expected other species, notably the *Ochlerotatus caspius*, to be active, and, indeed, in the specimens sent from Portsmouth to Millbank both species were freely represented. Surgeon Commander Dickenson, however, said that the species mentioned by Colonel Macarthur was found only in very small numbers, and the chief cause of the nuisance was assumed to be the salt-water mosquito, which was present in great abundance. Wing Commander Whittingham and Colonel Crawford Kennedy remarked upon the extraordinary way in which mosquitos of this species bred at Malta.

[7] *Nederl. Tijds. v. Geneeskunde*, 67, 2, 326, 1923.

TIME REQUIRED FOR GALL-STONE FORMATION.

WHILST in laboratory animals gall-stone formation may be induced experimentally in a few days or weeks, sufficient evidence of the time required in the human subject has not been forthcoming. The majority of the cases reported hitherto which are supposed to throw light on the point have been instances in which a surgical examination of the gall bladder was made after an attack of typhoid fever, and the period elapsing between the two has been taken, almost without question, as the age of the gall stones discovered. As calculi may exist during life without giving any noticeable symptoms of their presence it may be objected that their formation was antecedent to the attack of typhoid fever. The presence of typhoid bacilli within the calculus cannot be taken as clear evidence that they were imprisoned by the deposit of cholesterin, for it has been shown experimentally that biliary calculi, rendered sterile, can imbibe organisms from a culture. Cameron[1] reports an interesting case in which the usual criticism would seem to be met. Here the patient was submitted to operation under a diagnosis of cholecystitis. The gall bladder was twice the normal size, acutely inflamed, and tense from distension with fluid. The walls were thin, and no abnormalities of the biliary ducts were found. The gall bladder was evacuated, the escaping contents being first a colourless mucoid material and then normal-looking hepatic duct bile in a free flow. It was concluded that the obstruction to the cystic duct had been due to a mucous plug. The collapsed organ was ascertained by palpation and direct inspection of its interior to be free from calculi or cholesterin deposits, and it was fixed to a catheter for drainage. Normal-looking bile flowed freely for a fortnight, and on the catheter being removed at the end of that time bile continued to discharge through the fistulous tract for five days and then ceased. The patient was discharged twenty-four days after operation, but had to return to hospital on the fifty-sixth day on account of dull aching pains in the gall-bladder region, accompanied by the discharge of pus from the fistulous tract. An attack of influenza delayed the second operation till eighty-six

[1] *Journ. Amer. Med. Assoc.*, November 17th, 1923, p. 1671.

days after the first. Then a thick-walled contracted gall bladder was found containing numerous calculi of various sizes, the largest measuring 17 by 15 by 12 mm. For the most part they consisted of cholesterin, with a small amount of calcium and bile pigments. Thus the extreme age of these stones was eighty-six days, although it is highly probable they had already formed within a period of fifty-six days.

NURSING IN THE UNITED STATES.

IN December, 1918, the Rockefeller Foundation invited persons interested in the development of public health to attend a conference in New York to discuss the status of public health nursing and the education required for training the needed personnel. The result of the conference was that the president of the Foundation appointed a committee of seven in January, 1919, to study the proper training of public health nurses. The committee, amongst whom were such well known authorities as Dr. Welch of Baltimore, Professor Winslow of Yale, and Dr. Stillman of New York, was considerably enlarged, and a year later was asked to broaden the scope of its inquiry to include a study of general nursing education. The report,[1] published this year, is contained in a volume of close on six hundred pages on nursing and nursing education in the United States. The report of the committee, however, covers only thirty of these pages. The remainder of the volume is a survey by the secretary of the committee, Miss Josephine Goldmark, of the exhaustive and detailed investigations, made by herself and several nursing and lay assistants on behalf of the committee, into the conditions of nursing in the United States. These investigators have examined practically the whole field of nursing services, and have left no stone unturned in order to expose the existing conditions and to suggest measures for improving them. Miss Goldmark's survey is divided into two parts—the functions of the nurse and the training of the nurse—and each of these has a number of headings and subheadings, such as public health nursing, the nurse in private duty, the nurse in institutions, the hospital school of nursing, training courses for subsidiary nurses, the university school of nursing, and post-graduate courses. The committee emphasizes the fact that the public health nurse is an all-important factor in preaching the gospel of sanitation in the homes of the people—a fact which has been realized internationally in the present activities of the League of Red Cross Societies. In America 11,000 nurses are employed in this way, but the committee states that 50,000 are required in order to meet generally accepted standards. For hospital and private sick nursing there were at the time of the report 149,128 trained and registered nurses, including the 11,000 employed in public health service, some 11,000 more in hospitals and institutions, and 120,000 in private nursing, the total number representing one nurse for every 700 of population. But in addition to the registered nurses, there were 54,953 student nurses in the hospitals, and 151,996 of an unregistered class of nurses known as "attendants and practical nurses," so that the entire body engaged in nursing work in the United States was equal to one trained or untrained nurse to every 294 of population. The committee recommends the abolition of the untrained nurse and her replacement by a subsidiary class of nurse, to be called a "nursing aide," who should have a definite training, be licensed by the State, and be entrusted with the charge of chronic or convalescent patients, leaving the graduate and registered nurse for public health nursing and for the nursing of serious and acute cases. Three courses of training for nurses are recommended—one for the subsidiary nurse in smaller hospitals and institutions; a highly organized course for the registered nurse in training schools and hospitals, supplemented by post-graduate courses; and a university course for those undertaking special educational duties. At the close of the training in a university school of nursing the student would receive a diploma and a bachelor's degree in nursing or in science. The committee considers that these university schools of nursing are of fundamental importance in the furtherance of nursing education. The volume contains material which should be studied by all engaged in nursing services, and especially by hospital and public health administrators. If the committee's proposals are ever carried out in their entirety the nursing profession in the United States will reach a standard so far unequalled in any other country. The one thing lacking, however, in this highly organized education is the element of human sympathy, which is an essential attribute of the nurse, but cannot be taught. There is also the danger of overnursing in a community where the proportion of nurses is very high.

[1] *Nursing and Nursing Education in the United States.* Report of a Committee for the Study of Nursing Education, and a Report of a Survey by Josephine Goldmark. New York: The Macmillan Co. 1923. (Demy 8vo, pp. xvii + 585. 2 dols.)

COCAINE AND COCAINE SUBSTITUTES.

THE report published in this issue (p. 1154) of the discussion at the Royal Society of Medicine on the comparative value of cocaine substitutes is interesting as summarizing the present attitude of different branches of the profession to cocaine and its substitutes. The quiescent satisfaction with which medical practitioners had for some years regarded cocaine and its substitutes—using cocaine chiefly as a surface anaesthetic and novocain and stovaine as infiltration anaesthetics—was disturbed by the notoriety which the vice of cocaine-taking had gained in this country, giving rise to stringent regulations by the Home Office governing the sale of cocaine. In May last a committee was set up by Mr. Neville Chamberlain, then Minister of Health, to inquire into the whole question of cocaine and cocaine substitutes. This committee issued a circular to members of the profession thought most likely to be specially interested, but has not yet been able to make its report. Among the reasons for setting up the committee were the encouraging reports of a new cocaine substitute named butyn, a synthetic product discovered in Chicago in 1918, by the Abbott laboratories working in collaboration with Professors Roger Adams and Oliver Kamm of the University of Illinois. A committee of the Section of Ophthalmology of the American Medical Association reported in 1922 that butyn was more powerful than cocaine, acted more quickly and for a longer time, was less toxic, had no effect on the size of the pupil, had no ischaemic action and therefore caused no shrinking, could be boiled without impairing its efficiency, did not deteriorate by keeping, and had no attraction for the drug-taker. Mr. W. M. Beaumont[1] reported favourably on it, more particularly from the ophthalmological point of view, and said that he believed butyn to be superior to cocaine as a local anaesthetic. At the Annual Meeting of the British Medical Association last July Dr. William Hill[2] expressed the opinion that butyn might be a useful alternative where cocaine was contraindicated, and emphasized its low reported toxicity as compared with cocaine; on the other hand he pointed out that the cost of butyn was five times that of cocaine, that it was not uniformly reliable, having quite failed to anaesthetize on certain occasions, and that it did not produce shrinking. More recently Mr. Eric Watson-Williams[3] published a preliminary note of some experiments on the toxicity of cocaine, butyn, and other cocaine substitutes, which had

[1] BRITISH MEDICAL JOURNAL, January 13th, 1923, p. 57.
[2] Ibid., November 10th, 1923, p. 876.
[3] Ibid., December 1st, 1923, p. 1018.

brought him to the conclusion that butyn was at least as dangerous as cocaine. In three of the fatal cases reported by Mr. E. Watson-Williams cocaine was, however, applied as well as butyn, and one death was clearly due to an overdose of butyn. At the joint discussion at the Royal Society of Medicine the consensus of opinion seemed to be that as no other drug than cocaine combines ischaemic and anaesthetic properties no existing substitute can effectively supplant it; that the claims made for butyn as regards freedom from toxicity are apparently unfounded; and that with the control now exercised in this country the possibility of abuse by narcomaniacs need not concern the surgeon. At the same time it may perhaps be suggested that cocaine is often used in unnecessarily large quantities. In 1888 De Havilland Hall showed that the alkalinization of cocaine solution by a trace of sodium bicarbonate greatly increased its anaesthetizing powers. A. Abraham[4] recently stated that he had found a 3 per cent. solution of cocaine to be as effective as a 20 per cent. solution in inducing surface anaesthesia, provided that potassium sulphate (2 per cent.) was added to the solution up to a quarter of its amount; this confirms the observation of Hirsch in 1920.

POIKILOCYTES IN NORMAL BLOOD.

DRESBACH in 1904 described a case, a normal healthy young adult, in which 90 per cent. of the red blood corpuscles were elliptical in shape, the average length of the corpuscles being two and a half times that of the average breadth. In all other respects the appearances were normal. Ten years later Bishop found a similar condition in the blood of a young male who was suffering from appendicitis, 75 to 80 per cent. of the red corpuscles being elliptical. The possible effect of mechanical distortion in making the preparations could be eliminated. The sister of this patient showed the same abnormality, an observation which suggested some congenital peculiarity. Huck and Bigalow[5] now add another case. Fresh preparations made from the blood of a strong healthy female medical student disclosed elliptical and elongated red cells forming between 53 and 84 per cent. of the total erythrocytes. No nucleated erythrocytes could be found, and the various leucocytes and platelets were normal, as was also the haemoglobin estimation. Wet preparations preserved for a period of three weeks showed no increase in the percentage of abnormal forms, in marked contradistinction to the phenomena observed in the so-called "sickle-cell anaemia," of which an account was given recently (p. 1109). The mother of this patient had the same blood peculiarity, but none of the rest of the family. The patient herself has several times acted as a blood donor, and no untoward effects have been noticed in the recipients; indeed, in one patient with secondary anaemia who recovered no elliptical cells could be found after two months. We may conclude, therefore, that the anomaly is inherent in the cells, and cannot be transmitted by intravenous injections of blood. Hereditary transmission, while not definitely established, is probable.

PELLAGRA AND MAIZE.

As we had recently to recall, the etiology of pellagra is still in doubt. There is some evidence that it belongs to the class of deficiency diseases, and the oldest theory is that it is associated in some particular way with a diet of maize. This theory has been called into question over and over again, and fresh evidence against it is afforded by a recent bulletin issued by the American Relief Administration. When it was decided early in 1922 to send seven million bushels of maize to Russia the wisdom of choosing that cereal was questioned on the ground that its use as an exclusive diet might be expected to lead to an outbreak of pellagra in the famine area such as had occurred in Rumania in 1916. The ordinary diet of the Rumanian peasant consisted of corn meal mush, milk, and onions; pellagra made its appearance soon after the milk element of this diet disappeared, when the German invaders drove off all the cattle. Mainly because the money available for relief in Russia would buy two and a half times as much maize as any other cereal, it was decided to risk the chance of pellagra, for, as one of the administrators expressed it, "corn (maize) was the sole hope against death; Russia had got beyond the fear of disease." In the result no outbreak of pellagra occurred; in the whole of the Volga famine district not a single case was reported. In Ukraine there were twenty suspected cases which were specially investigated. Of these only four were found to be suffering from true pellagra, and not one of the four had eaten any of the American corn. The supplementary food of the Russian peasants was negligible, for previous to the arrival of the corn they had existed on the bark of trees, clay, weeds, and even human flesh. With maize as their sole article of diet, nevertheless, they did not develop pellagra.

SMALL-POX AND CHICKEN-POX IN THE UNITED STATES.

A RECENT report[1] by Dr. Hugh S. Cumming, Surgeon-General of the United States Public Health Service, contains some interesting data as to the prevalence and fatality of notifiable diseases in 1922. In health administration the several States are independent of each other, and to a large extent of the federal authority, so that returns are not always strictly comparable, case rates and death rates having a significance depending partly on differing standards of local vigilance and of reporting by practising physicians. Even the total populations dealt with are not absolutely identical, though very nearly so. In forty-three States and three Districts (population 103,318,256) the small-pox cases reported in 1922 numbered 1,691, as contrasted with a "median"[2] of 60,914 in 1913-21. The fatality rates differed immensely as between State and State. In Arizona there were 134 deaths in 468 cases, or 28.6 per cent., and in Colorado 270 deaths in 1,086 cases, or 24.9 per cent. Next came Missouri with 82 deaths in 657 cases, or 12.5 per cent., Kansas with 68 deaths in 842 cases, or 8.1 per cent., and Oklahoma with 57 deaths in 736 cases, or 7.7 per cent. These States adjoin each other in the north-west central and south-west central parts of the United States. Pennsylvania and Maryland, in the north-east, had each a 5.9 per cent. fatality rate, but the total cases were only 102 and the deaths 6, so the figures are not important. At the other extreme from the high fatality of Arizona and Colorado, a number of States were well under 1 per cent. in their case mortality. Of the total 31,691 cases in the year 841 proved fatal, so that the fatality rate over all was 2.68 per cent. Making every allowance for imperfect returns it would seem fairly certain that very different types of small-pox have gone to make up this average rate. Dr. Cumming's report, being only statistical, does not comment on questions of prevalence or types or fatality, and small-pox is only one of twenty-four communicable diseases dealt with. The statistics of chicken-pox are of interest in the present connexion. In forty-six States and three Districts (population 107,385,288)

[4] BRITISH MEDICAL JOURNAL, EPITOME: October 27th, 1923, para. 304.
[5] *Bull. Johns Hopkins Hosp.*, November, 1923, p. 390.

[1] Public Health Reports, Vol. 38, No. 44. Washington. 1923.
[2] The word "median" is not quite identical with "mean" or "average," but is used in preference, and "has been defined as the middle item in an array. If the numbers of cases reported are arranged so that the greatest number reported in any one year is first, the second greatest number is second, and so on, then the number of cases in the centre of the array is the median."

there were 131,018 notifications, and in forty States and three Districts (population 98,252,556) there were only 70 deaths, the fatality rate being 0.05 per cent., or one death in 2,000 cases. The largest prevalence was in Pennsylvania, but among 19,112 cases not a single death was recorded. In Illinois there were 13,442 cases with 13 deaths, or 0.1 per cent., and in New York there were 15,481 cases with 16 deaths, again 0.1 per cent. Taking the total figures set down for small-pox as contrasted with those for chicken-pox, the small-pox fatality rate, low though it was, was fully fifty times as high as the chicken-pox fatality rate. Where the small-pox fatality rates were very low the figures for the two diseases more or less overlapped, but the broad indication would seem to be that, notwithstanding possible errors in individual cases, the profession in the States has been fairly able to recognize the distinction between chicken-pox and the mild type of small-pox, just as the two diseases have been distinguishable in this country. To this subject of the comparative diagnosis of these diseases two contributions were published in our last issue, the one by Dr. Painton, illustrated by a set of photographs on special plate paper, and the other by Dr. G. F. Rigden. Both writers have had experience of recent events in Gloucester and Gloucestershire. As regards prevalence apart from mortality, the seven American States in which there was most small-pox, measured by the number of notifications per 1,000 of population, were Oregon 1.41, South Dakota 1.32, Arizona 1.27, Washington 1.13, Montana 1.07, Colorado 1.01, and Wyoming 1.00. The seven States with most chicken-pox, similarly measured, were Vermont 4.17, Columbia (District, not State) 2.71, Mississippi 2.34, Pennsylvania 2.13, Virginia 2.03, Illinois 2.01, and Wisconsin 2.01. It will be observed that no State appears in both of these lists.

A POST-GRADUATE course on diseases of the nervous system will be held at the National Hospital for the Paralysed and Epileptic, London, from February 4th to March 28th, 1924. It will consist of clinical lectures and demonstrations, attendance in the out-patient department, and pathological lectures and demonstrations. The fee for this course will be five guineas. If there are sufficient applicants there will be a special course of lectures on the anatomy and physiology of the nervous system (fee, two guineas). A series of clinical demonstrations on methods of the examination of the nervous system (fee, two guineas) will be given. A course of eight lectures and six demonstrations on neurological ophthalmology has also been arranged; the number for this course is limited, so that applications should be made early. The fee will be five guineas as a separate course, or three guineas if taken as part of the general course. A limited number of students can be enrolled as ward clerks or as clinical assistants in the out-patient department. Applications should be addressed to the secretary of the medical school at the hospital (Queen Square, W.C.1).

DR. JAMES GRANT ANDREW, who two years ago retired to Bournemouth, died very suddenly there on December 6th. After making a recitation at a Scottish graduates' dinner he fell back in his chair and immediately expired. He was consulting surgeon to the Victoria Infirmary, Glasgow, and had served on the Council and many committees of the British Medical Association.

OWING to the Christmas holidays all communications and advertisements intended for insertion in our issue dated December 29th should be received not later than Saturday morning, December 22nd.

ANNUAL DINNER OF THE ROYAL SOCIETY OF MEDICINE.

THE annual dinner of the Royal Society of Medicine was held at the Hotel Victoria on Tuesday evening, December 11th. Sir WILLIAM HALE-WHITE, K.B.E., President of the Society, was in the chair, and the principal guest was H.R.H. the Prince of Wales, who recently became an Honorary Fellow. The other guests were the Archbishop of Canterbury, Viscount Haldane, and Sir W. Joynson-Hicks, M.P. (Minister of Health). About 500 Fellows attended, and among those supporting the president at the principal table were: Sir Humphry Rolleston, Sir John Bland-Sutton, Sir Anthony Bowlby, Sir William Macpherson, Sir Robert Hill, Sir W. Arbuthnot Lane, Sir Berkeley Moynihan, Sir Thomas Horder, Sir StClair Thomson, Sir William Willcox, and the presidents of the Sections.

The Progress of the Society.

The PRINCE OF WALES, who was enthusiastically received, proposed the toast of "The Royal Society of Medicine." He said that he had been looking through the history of the parent body, the old Medical and Chirurgical Society, and he noted the advice given by one of its former presidents, Sir Benjamin Brodie, who urged all, and especially the young, to abstain from medical politics and to keep away from exciting and irritating discussions. He thought that advice very sound, and his object that evening was not to start any irritating discussions, but chiefly to say how deeply he appreciated the honour which the Society had conferred upon him by electing him to the honorary fellowship. Someone had said that society would be happier if there were no societies, but the Prince thought that the community was well able to look after itself in this respect. The law of the survival of the fittest was merciless where learned bodies were concerned. If any learned body failed to prove its worth no artificial feeding would prevent it from becoming a learned corpse. But when a society, having started from small beginnings, developed into an institution of increasing numbers and prestige so that its name was known and honoured throughout the world, one could be quite sure that the world had real need of it, that it had a genuine job to do, and was doing it very well. He did not think anyone could dispute that the Royal Society of Medicine belonged to this latter category, though it was not for him as the youngest honorary fellow to praise its work or predict its future. The Society was a federation of sixteen distinct medical bodies, each of which existed at one time separately in the interests of its own particular branch of medical science. Twenty years ago, with a wisdom that did them credit, they decided to fuse their separate existences into one body representing medical science as a whole. The Royal Society of Medicine was the result of the fusion, and as a consequence all its elements had grown not sixteen but sixtyfold stronger. This achievement was largely due to the energy and perseverance of Sir John MacAlister, who might well be proud of his achievement, as the Society was proud of him. (Applause.)

Sir W. HALE-WHITE, after thanking the Prince, said that the Society was manifestly prospering. It numbered four thousand Fellows and Members. During the past year it held one hundred meetings. To its library—the largest and best equipped medical library in the Empire—2,000 books had been added, making 120,000 in all. During the year it had sent out 3,000 parcels of books to Fellows resident in the country or overseas, in addition to the books lent to those in town. The number of Fellows who wrote for information which was to be gathered out of the library was so great and their wants so particularized as to consume the whole time of one official. The library contained 4,000 medical prints, which, thanks to the kindness of Dr. Arnold Chaplin, would presently be catalogued, remounted, and indexed. He paid a tribute to Sir John MacAlister, the best of friends and the wisest of counsellors, and to the indefatigable staff, honorary and other, all of whom pulled their weight. The year 1923 had seen the Society breaking new ground in two directions. The Society, as His Royal Highness had said, was the result of an amalgamation of some sixteen others. Owing to the development and advance of medicine, several special Sections had had to be added, so that the Sections now numbered twenty-four. It was

quite natural that each Section should think itself very important, and so it came about that there was a tendency—only a slight tendency—for some Sections to forget that they were but members of the whole body. There was no such thing as a clear-cut specialty, and it was very necessary if the Society was to function properly that the Sections should realize that they were members one of another. Therefore, during the summer, the presidents of all the twenty-four Sections met together and decided that, in order to prevent any possibility of narrowness, meetings of several Sections together, or even of the whole Society, should be held to discuss subjects of common interest. These discussions were now taking place from time to time, and he anticipated that they would add not only to the usefulness but to the renown of the Society. The other direction in which the Society had broken new ground was in the formation of a Section of Comparative Medicine. It was an extraordinary thing that in the history of medicine the diseases of animals and the diseases of man should have been treated separately. Until recent times the diseases of animals had not been studied at all, in spite of the fact that several great men in medicine—Jenner, for example—had shown that diseases in animals and in man were in many respects similar, though, on the other hand, they frequently differed. In natural science knowledge was acquired by observing how phenomena resembled one another and how they differed from one another. Clearly, therefore, it could only be to the general advantage to study disease as it existed both in animals and in man, and even to extend the study into the plant kingdom. After all, animal and vegetable life had many common characteristics: they were subject to much the same chemical changes, and disease in both cases was nothing but a perversion of the normal processes of life. One instance of the importance of animal diseases in relation to man was that common disease known as simple goitre. This existed not only in man but in many animals. It was known to be due to a deficiency of iodine in the gland. Some experimenters lately had observed that if the mother dog had iodine completely withheld from the food the puppies would have goitre. It had been known, of course, for a long time that iodine was a good thing for goitre, but up to now that knowledge had been empirical and ill understood. As a result of observations on men and animals in all parts of the world, particularly in France, Switzerland, and the United States, where goitre was prevalent, an attempt was being made completely to eradicate the disease by ensuring that food contained a minute amount of iodine. If this combined study of man and animals proved as successful as was expected, it would lead to the extinction of simple goitre both in animals and in man, and with goitre would go the allied disease of cretinism. In the new Section human and veterinary medicine were equally represented, and the Society had been fortunate enough to secure for the first Sectional President, Sir Clifford Allbutt.

The Church, the State, and the Law.

Dr. HERBERT WILLIAMSON, in proposing the toast of "The Guests," said that the Society welcomed that evening the Archbishop of Canterbury, representing the Church, Sir William Joynson-Hicks, representing the State, and Lord Haldane of Cloan, representing the Law. Church, State, and Law were all inextricably woven in the history of Medicine. It was right that His Grace of Canterbury should be at their board, not only because of the dignity and wisdom with which he himself had filled his great office for twenty years, but because from the earliest dawn of civilization medicine and religion had been closely associated. It might justly be claimed that medicine had always respected the prerogatives of religion, though the Church had not always respected the prerogatives of medicine. The sick poor in the hospitals had found in the clergymen their warmest friends, and the Society welcomed the Archbishop because of the debt which medicine owed to the Church, because of the common service which united the two callings, and because of the universal esteem which the Archbishop had won for himself. Sir William Joynson-Hicks, before coming to his present position, gained great success as the head of the Post Office. A Minister of Health should possess many qualities, including the courage of a Daniel: he must be something of a poet and a philosopher, and above all a lover of humanity, possessed of wisdom and understanding, able to dream dreams and see visions, and to translate them into action. It was difficult to discover a man who united all these qualities, unless indeed a search was made for him in the medical profession! He took advantage of the fact that the Minister that evening was unaccompanied by his permanent officials, and pleaded for a more liberal endowment of medical research and education. Lord Haldane was one of those coveted mortals who had attained distinction in many diverse fields of learning and administration. As statesman, philosopher, scholar, and lawyer, his great gifts had been placed unreservedly at the service of his fellows. He had never allowed party loyalty to deflect him from the path which he believed to be right, and he wore the Order of Merit, which was a distinction for all time.

Lord HALDANE said that it fell to him to try to convey a layman's sense of gratitude to the medical profession. The most valuable thing that the medical profession had taught the community was that people were their own enemies and that if they would but trust to Nature and not hinder her all would be well. He was an old conservative, and he looked back to Hippocrates, a man who understood thoroughly what life meant, and that if matters were left to life and to Nature, life and Nature would deliver us. Since the time of Hippocrates there had been only one other individual, and he a representative one, whom he had regarded with the same kind of admiration—namely, the old Victorian general practitioner, particularly the country practitioner of his own earlier days. This general practitioner was a splendid person even if he did not know very much and if his remedies were rough. Lord Haldane had known representatives of that class set out on their rounds in the islands of Scotland, without knowing in the least what demands would be made on their resources, but ready in the course of their visits from island to island to cut off a leg, or extract a tooth, or perform an operation for appendicitis. What the results were he never knew, but they were very useful people. To-day, however, there was a new atmosphere. They had learned to have faith that life and Nature would assert themselves if only the hindrances to their operations were removed. Surgeons discovered this perhaps even earlier than physicians. They learned that it was not necessary to resort to antisepsis, but that asepsis was enough—that is to say, if Nature were allowed to be unembarrassed she would assert herself and restore the equilibrium. That seemed to be the line which medical opinion was following. The President had mentioned the thyroid gland: he might have spoken also of the islands of Langerhans; these were bodies full of vitality and creative power if their stimulating processes were not defeated through lack of knowledge on our own part. A time had been reached when medicine was entering upon an entirely new phase. He looked forward to the day when, with very small provocation, he would go, not into a dismal nursing home, with no books or comforts, but into a gay establishment, which would be set up as a result of the combination of the instincts of science and commerce. They were grateful to the medical profession, not because it could avert death eventually, but because it succeeded in postponing death and warding off its unnecessary surprises for as long as possible.

Sir W. JOYNSON-HICKS, who also responded, said it would have been more appropriate if the doctors had invited him to dinner when he had control of the Treasury. But he was there to express his gratitude for favours to come from the great medical bodies on whom he must depend. The Minister of Health was really a creation of the doctors. It was on account of the demand so incessantly made by various members of the medical profession that he continued in existence. He had numerous requests made to him for more money to be spent on research, for improvements in medical education, for the extension of hospitals, for the eradication of epidemics, and his duties extended not only to the grave but beyond it, for it was part of his business to provide the medical profession with the necessary bodies for dissection. If the Minister of Health were himself a

medical man it was possible that he would spend too much money on a particular branch in which he happened to be interested. It was his business to judge between the various claims, with due regard to the attenuated state of the public purse, and to prepare the claims in such a way that they might be understandable to that remarkably non-scientific body, the House of Commons. It was to the Fellows of the Society that he looked for advice. The Society was a thoroughly independent body, free from State control. It had no irritating political questions to trouble it. He looked to it for advice and encouragement, and for consolation in his failures. The office of the Minister of Health was the most difficult that he had ever filled, and if to its responsibilities was added, as the President rather suggested, the medical care of animals, he would indeed have no peace. The situation with regard to foot-and-mouth disease was a very grave one. The number of animals now being slaughtered every day on account of this pest represented a value of £70,000. He was a member of a committee of the Cabinet appointed that day to deal with the question, and he would be very grateful for any help which could be given him by the medical profession which might assist in the control and prevention of this scourge.

The proceedings of the dinner were over at the commendably early hour of 10.30.

THE GENERAL ELECTION.

MEDICAL MEMBERS OF THE NEW PARLIAMENT.

THE following five medical men who were members of the last Parliament have been returned to the House of Commons at the recent general election:

Sir GEORGE BERRY, LL.D., F.R.C.S.Ed. (C.), Scottish Universities; returned unopposed.

Dr. W. A. CHAPPLE (L.), Dumfries. Majority 1,727 on a total poll of 24,487.

Dr. F. E. FREMANTLE, O.B.E. (C.), St. Albans. Majority 5,328 on a total poll of 25,077.

Sir SYDNEY RUSSELL-WELLS, M.D. (C.), University of London. Majority 1,444 on a total poll of 8,050.

Dr. J. H. WILLIAMS (Lab.), Llanelly. Majority 9,298 on a total poll of 38,270.

Three medical men who sat in the last Parliament did not seek re-election—namely, Sir John Collie, C.M.G., Dr. L. G. S. Molloy, D.S.O., and Sir William Whitla; another, Mr. C. Harvey-Dixon, died on September 22nd, 1923.

New Members.

The following five members of the medical profession have been elected to Parliament for the first time:

Dr. L. HADEN GUEST (Lab.), Southwark North. Majority 362 on a total poll of 14,968.

Dr. Haden Guest was an unsuccessful candidate in the general election of 1922. He was a civil surgeon in the South African war. During the late war he held various posts in connexion with the British Red Cross and the Croix Rouge Française; he served also in the R.A.M.C. with the rank of Major, and won the Military Cross. He acted as secretary and medical adviser to the delegation to Soviet Russia in 1920, and among other writings on medico-sociological subjects lately contributed a series of articles on "Public Health in Soviet Russia" to the BRITISH MEDICAL JOURNAL.

Mr. SOMERVILLE HASTINGS, F.R.C.S. (Lab.), Reading. Majority 1,542 on a total poll of 37,178.

Mr. Somerville Hastings stood unsuccessfully for Epsom at the 1922 election. He is surgeon in charge of the ear and throat department of the Middlesex Hospital and lecturer on diseases of the ear, throat, and nose at the Middlesex Hospital Medical School. He was a vice-president of the Section of Laryngology and Otology at the last Annual Meeting of the British Medical Association. He is a member of the Public Health Advisory Committee of the Labour Party, and has been a prominent advocate of a State Medical Service.

Professor THOMAS SINCLAIR, C.B., F.R.C.S. (C.), Queen's University, Belfast; returned unopposed.

Professor Sinclair is a Senator of the Parliament of Northern Ireland; surgeon to the Belfast Royal Hospital; professor of surgery in Queen's University, Belfast, and a member of the General Medical Council. He served during the war as consulting surgeon to the British Expeditionary Force with the rank of Temporary Colonel A.M.S., and is a past-president of the North of Ireland Branch of the British Medical Association.

Dr. G. E. SPERO (L.), Stoke Newington. Majority 1,101 on a total poll of 15,629.

Dr. G. E. Spero was an unsuccessful candidate for West Leicester at the 1922 election. He qualified in 1919, having previously served in the Navy. He is a member of the Leicester and Rutland Division of the British Medical Association.

Lieut.-Colonel T. S. BEAUCHAMP WILLIAMS (Lab.), Kennington. Majority 510 on a total poll of 21,149.

Colonel Beauchamp Williams is a retired officer of the Indian Medical Service, in which he served for twenty years. During the late war he was on active service on the North-West Frontier and in Mesopotamia. He is a member of the Executive of the Westminster and Holborn Division of the British Medical Association.

At the general election in November, 1922, there were 35 medical candidates, of whom 13 secured election. At the general election on December 6th, 1923, there were 25 medical candidates, of whom 10 have been returned to Parliament. Besides these ten medical men, two valued members of the Medical Committee of the late House of Commons have been re-elected. Sir Henry Craik was returned unopposed for the combined Scottish Universities, and Sir Martin Conway was returned at the head of the poll for the combined English Universities.

Unsuccessful Candidates.

We regret to record that four medical men who sat in the last Parliament were defeated at the polls—namely, Dr. Walter Elliot, M.C. (C.), Parliamentary Under Secretary for Health for Scotland, who had represented Lanark since December, 1918; Dr. J. E. Molson (C.), who represented Gainsborough during the same period; Dr. Alfred Salter (Lab.), who was elected for Bermondsey West in 1922; and Dr. Thomas Watts (C.), who was elected for the Withington Division of Manchester in 1922.

The following members of the medical profession were also unsuccessful; several of them had previously contested either the same or other constituencies:

Dr. H. B. Bates (C.), Newton, Lancs.
Dr. Ethel Bentham (Lab.), Islington East.
Dr. R. Dunstan (Lab.), Birmingham, Ladywood.
Dr. O. Gleeson (Lab.), Portsmouth North.
Dr. G. B. Hillman (C.), Normanton.
Sir Henry Lunn (L.), Brighton.
Dr. H. B. Morgan (Lab.), Camberwell North-West.
Dr. A. G. Newell (L.), Tottenham South.
Lieut.-Colonel A. C. Osburn, D.S.O., R.A.M.C.(ret.) (Lab.), Walsall.
Dr. R. W. Simpson (L.), Newcastle-upon-Tyne North.
Dr. R. M. Wilson (L.), Saffron Walden.

[Dr. R. L. Ridge, whose name appeared in the list of medical candidates in our issue of December 1st, did not contest the Enfield Division.]

Polling Figures.

The following are the polling figures at all the contested elections in which there were medical candidates on December 6th. Medical names are printed in italics, and an asterisk denotes that the candidate sat in the late Parliament.

DUMFRIES:		
**W. A. Chapple* (L.)		13,107
J. Charteris (C.)		11,380
Liberal majority		1,727
ST. ALBANS:		
**F. E. Fremantle* (C.)		11,968
C. E. Thomson (Lab.)		6,640
H. K. Neild (L.)		6,469
Conservative majority		5,328
UNIVERSITY OF LONDON:		
**Sir S. Russell-Wells* (C.)		4,037
A. F. Pollard (L.)		2,593
H. G. Wells (Lab.-Soc.)		1,420
Conservative majority		1,444
LLANELLY:		
**J. H. Williams* (Lab.)		21,063
R. T. Evans (L.)		11,765
L. B. Thomas (C.)		5,442
Labour majority		9,298

SOUTHWARK (NORTH):		
L. Haden Guest (Lab.)		7,665
*E. A. Strauss (L.)		7,303
Labour majority		362
READING:		
Somerville Hastings (Lab.)		16,657
*Hon. E. Cadogan (C.)		15,115
F. Maddison (L.)		5,406
Labour majority		1,542
STOKE NEWINGTON:		
G. E. Spero (L.)		8,365
*G. W. H. Jones (C.)		7,264
Liberal majority		1,101
KENNINGTON:		
T. S. Beauchamp Williams (Lab.)		8,292
Sir R. Blair (C.)		7,782
T. O. Jacobsen (L.)		5,075
Labour majority		510
LANARK:		
T. Dickson (Lab.)		11,384
W. E. Elliot (C.)		11,154
Labour majority		230
LINDSEY, GAINSBOROUGH:		
Sir W. Winfrey (L.)		9,694
J. E. Molson (C.)		7,841
J. Read (Lab.)		3,039
Liberal majority		1,853
BERMONDSEY (WEST):		
R. M. Kedward (L.)		9,186
A. Salter (Lab.)		8,298
Liberal majority		888
MANCHESTER, WITHINGTON:		
E. D. Simon (L.)		13,944
T. Watts (C.)		10,026
Liberal majority		3,918
LANCASTER, NEWTON:		
*R. Young (Lab.)		12,492
H. B. Bates (C.)		8,375
Labour majority		4,117
ISLINGTON (EAST):		
A. S. Comyns-Carr (L.)		10,670
*A. U. M. Hudson (C.)		9,038
Ethel Bentham (Lab.)		6,941
Liberal majority		1,632
BIRMINGHAM, LADYWOOD:		
*N. Chamberlain (C.)		12,884
R. Dunstan (Lab.)		11,330
Conservative majority		1,554
PORTSMOUTH (NORTH):		
*Sir B. Falle (C.)		13,229
O. Gleeson (Lab.)		9,523
L. Williams (L.)		3,584
Conservative majority		3,706
WEST RIDING, NORMANTON:		
*F. Hall (Lab.)		15,455
G. B. Hillman (C.)		4,365
Labour majority		11,090
BRIGHTON (2 seats):		
*G. C. Tryon (C.)		30,137
*A. C. Rawson (C.)		29,759
W. Runciman (L.)		17,462
Sir H. Lunn (L.)		16,567
A. Gordon (Lab.)		9,545
H. Carden (Lab.)		9,040
Conservative majority		12,675
CAMBERWELL (NORTH-WEST):		
*T. J. Macnamara (L.)		6,843
H. B. Morgan (Lab.)		6,763
E. T. Campbell (C.)		6,045
Liberal majority		80
TOTTENHAM (SOUTH):		
P. Alden (Lab.)		10,312
*P. E. B. Malone (C.)		7,687
A. G. Newell (L.)		3,974
Labour majority		2,625
WALSALL:		
*P. L. Collins (L.)		16,304
S. K. Lewis (C.)		14,141
A. C. Osburn (Lab.)		7,007
Liberal majority		2,163
NEWCASTLE-UPON-TYNE (NORTH):		
*N. G. Doyle (C.)		12,715
R. W. Simpson (L.)		6,321
J. Beckett (Lab.)		5,374
Conservative majority		6,394
SAFFRON WALDEN:		
*W. F. Mitchell (C.)		9,652
W. Cash, junr. (Lab.)		6,398
R. M. Wilson (L.)		5,752
Conservative majority		3,254

Nova et Vetera.

NATIVE MEDICINE AND HYGIENE IN SINGAPORE.

INSPECTOR KING of the Sepoy Lines Police Station, Singapore, informed me one day that recently on a gambling raid—the Chinese and Malays are inveterate gamblers—he had seen two peculiar skulls. Inquiry had elicited the fact that they were very old Labuan skulls which had been handed down from father to son for several generations.

One evening in the golden glow of the setting sun Inspector King escorted me over a hill studded with the graves of departed Chinese. The Chinese are imbued with a spirit of reverence and veneration for their parents and ancestors. The ambition of the average Chinee is to have a large family to support him in comfort in his old age, and for this purpose he may acquire several wives; or he may purchase a few boys and adopt them as his sons. The Chinese bury their relatives on the summits of the highest hills in the vicinity, never omitting to place a dish containing some food at the graveside, lest the spirit of the departed should revisit the place of interment and be in need of sustenance for its gossamer substance. Having settled their ancestors, the mourners descend to the swamps and valleys, there to live huddled together in large numbers, an easy prey for all infective diseases, especially tuberculosis. Having reached the foot of the burial hill, we traversed a clearing in the jungle honoured by the name of road. Here we had an indication of European influence in a concrete trough about two feet in depth and width, which acted as a drain; filthy water laden with sewage slowly flowed along it, and lying in it were two putrefying young pigs. Following the road we came to a large fruit, flower, and vegetable garden owned by Chinese. The gardens were beautifully kept. Being evening, the gardeners were busy watering the flowers and vegetables. The drain was convenient; the material in it was wet, and also provided a certain amount of manure; the vegetables grew well in consequence. Can we wonder, then, at the prevalence of enteric, dysentery, and *Ascaris lumbricoides*? At least 90 per cent. of the native children are infested with the latter. It is a common incident for a child in a fit of coughing to expel from the mouth one or more worms five or six inches in length. A water-borne sewage scheme was commenced in Singapore some time ago, but will not be completed for a considerable period.

Eventually we arrived at a native house of the variety common in this locality: a wooden structure surrounded by domestic refuse of all sorts in which mosquitos breed. The roof is made rain-tight by a thatch made in lengths of about three feet from the dried leaves of the banana tree folded across a light strip of bamboo. To gain admittance to the house we carefully stepped over innumerable chickens of varying ages and avoided a goat tied to one of the door-posts; a sow and her litter of young pigs were browsing close by. The house consisted of two apartments each about twelve feet square. The one nearer the door was used as a living room; the other, separated by an incomplete partition, was apparently a bedroom. In a warm country soft beds are neither comfortable nor desirable. The natives mostly sleep on a flat wooden structure raised from the ground on trestles and for a pillow use a wooden or porcelain block placed behind the neck. The room of which I write contained a structure about twelve feet by eight, covered with floorcloth. There were numerous such pillows lying about, so that this bed was presumably common to the whole family. It is difficult to estimate the number of a native family, for so long as there is a spare corner they do not hesitate to take in a few lodgers. Present in the house at the time, however, were the old doctor, two young men, three women, and several children.

Our arrival caused a little excitement, but on being informed of the peaceful nature of our visit the inmates were friendly towards us. We were shown into the bedroom, and the old doctor lifted the two skulls from their resting place—a wooden box the bottom of which was nailed to the wall to form a small cupboard, while two pieces of cloth

hung as curtains in front. I examined the skulls carefully while the old man squatted on the bed. They were typical negroid skulls of adult males, old but not ancient. The base of each was entirely missing, as also were parts of the vault. The only feature worthy of note was the persistence of the metopic suture in both skulls in its entire extent. The skulls were marked all over by fine scratches as though they had been filed, and the alveolar process of each superior maxilla had been entirely filed away; when the Inspector asked why, they replied that the filings were used for curing all forms of gland swellings, including those specially classed as bubos, and the medicine man proceeded to explain his methods. A small biscuit box filled with grass was produced, and from it the old man drew a centipede about nine inches long, three-quarters of an inch in diameter, and of a brownish colour. It was quite harmless, and he allowed it to crawl about on his hand and arm. The centipede is eventually charred in the fire, its ashes carefully collected and ground into a fine powder in a mortar and pestle. The powder is then transferred to a small glass bottle and is ready for use. The skull is filed by means of a piece of skin from the dorsum of a shark dried in the sun to form a cylinder about fifteen inches long. The placoid scales with their enamel tips are admirably suited for grating down the bone.

In the treatment of tuberculous or other gland swellings the skin is washed to remove any sebaceous secretion. A small quantity of the skull gratings and of the charred centipede powder is added to some powder prepared from the root of the camphor tree and made into a paste with water. If the surface of the skin is broken hot water is used and the paste applied hot. If the surface is unbroken cold water is used and the mixture applied cold. In either case the applications must be made twice daily—at 7 a.m. and 4 p.m. To prove the efficacy of the treatment a small Chinese girl about 3 years of age was produced, much against her desire. On her neck there was a dirty sloughy-looking sore the result of a tuberculous gland, which the old man had been treating for three or four months. It was explained to us that the treatment was acting well in this case. Time, of course, is no object here, only the end-result counts. If by natural means and in spite of the treatment a sore is eventually cured it must be due to the treatment. This belief, of course, is not confined to the East. When asked if the native Chinese medicine men ever used a knife in treatment, the old man lifted up his hands and gazed at us in horror. Use a knife! A knife is only for killing with!

Let us now analyse the methods employed and compare them with those used in modern treatment. In both cases on the unbroken skin cold applications are used, and the medicine man, by means of his camphor, was using a mild counter-irritant and skin stimulant with slight antiseptic properties. When the skin is broken and ulcerated, modern and ancient methods agree in the value of heat. The Chinese uses the charred centipede simply as charcoal, which is well known for its deodorant and absorbent properties. The skull gratings are merely a collection of calcium salts of value for their soothing effect on the skin in itching, and for their astringent and desiccative properties. They are useful to promote healing in eczema and ulcers. Although antisepsis is unknown as such, yet it is practised by these old medicine men, whose knowledge is the result of the experience of generations. Asepsis is entirely unknown. One may ask, Why go to such trouble to obtain common materia medica? The answer I suggest is that throughout the whole world faith is one of the great factors in the art of healing, and faith with the natives is inexorably bound up with religion. Undoubtedly the methods employed are supposed to emanate from some deity.

We were now shown two powders invaluable in the treatment of skin diseases; equal quantities are infused with water and the infusion taken regularly over a long period. The powders were simply senna and a special brand of Siam tea. For dirty tongues there was a white powder, obviously borax, which is applied by the medicine man. He moistens his finger with saliva and dips it into the bottle, thereafter rubbing the powder over the patient's tongue. This treatment is combined with a course of powdered liquorice root internally. We had now to inspect a wonderful powder which the medicine man explained with great pride was of great value in the treatment of pains in the female abdomen. It had no specific value in the male. So far as I could judge it was a preparation of hyoscyamus. For wind in the stomach he had a preparation of menthol and liquorice. The great sedative, however, for the Chinese is that maker of happy dreams—the opium pipe; the Government has wisely legalized its use and has licensed special shops for opium smoking. The incidence of venereal diseases is very high in Singapore and is not confined to the native population. Such a condition of affairs is inevitable in a community in which males greatly predominate, and especially in an international port like Singapore. If houses and women were licensed and regular inspections carried out the occurrence of venereal diseases would diminish.

The bottles containing the drugs were of various sizes and shapes and were unlabelled except where a label indicating a former content had withstood the ravages of time. Any preparation which was not distinctive in smell or colour was quickly analysed by the old man by the simple method of dipping his finger into the bottle and tasting the contents. He was very anxious that I should sample some of his preparations, but repulsion at the method of sampling employed was greater than my inherent curiosity, so I refrained. In addition to the cures for the diseases mentioned, he had remedies for fever in the form of ground cinchona bark, and for rheumatism, worms, and a few other diseases the nature of which I could not discover. His stock-in-trade was very small, about a dozen bottles in all, and this, I think, is one of the points in which modern medicine might follow his example with advantage by seriously reducing the number of official drugs in the *British Pharmacopoeia*.

GORDON HARROWER, M.B.,
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THE REHOUSING OF SLUM DWELLERS.

THE problem of housing in relation to the health of the community is of such importance that it is a pity that a paper on the rehousing of slum dwellers[1] read by Mr. John J. Clarke at the meeting of the British Association last September should not have been written in a more concise, coherent, and interesting manner. It is not easy at first to gather the exact nature of his proposals for rehousing slum dwellers. In his introduction he says that "the solution of the problem is bound up with the payment of an equitable wage to meet the rent demanded," while in his chapter on Rehousing in the Future he says that "it must be remembered that unless the displaced poor are housed at a rent which is not an equitable rent, they will not be housed in a separate house at all." It is possible that Mr. Clarke felt the need of some restraint in setting forth before the British Association proposals decidedly socialistic in tendency; or peradventure he was afraid of the results of his own ideas. If, however, the housing problem is soluble at all, it may be that the only solution is to be found on the lines suggested in this paper. We shall endeavour to trace the sequence of Mr. Clarke's thoughts.

Slums reproduce all the defects with which a Public Health Department has to deal, and from the point of view of health and morals housing is the one essential reform. Overcrowding in slums leads to increased infant mortality, to impairment of health and unnecessary deaths of adults, to expense in connexion with doctors, nurses, hospitals, sanatoriums, and poor law institutions, to a low standard of morality, to increased cost in policing and cleansing and in the administration of justice, and to much waste of money in public houses. For more than sixty years local authorities had been fighting the housing difficulty, and just when the end of the first stage was in sight the war forced a halt. The problem is, in the words of Robert Browning, a "common problem, yours, mine, every one's"; and as such belongs to the realms of both ethics and economics.

[1] *Some Factors relating to the Rehousing of Slum Dwellers.* By John J. Clarke, M.A. A paper read before the Economics and Statistics Section of the British Association for the Advancement of Science, Liverpool, 1923. The University Press of Liverpool, Ltd.; London: Hodder and Stoughton, Ltd. (Cr. 8vo, pp. 68. 2s. net.)

Before the war the vast majority of workmen's dwellings were provided by private enterprise in the ordinary course of business. On a smaller scale building was undertaken by building societies, friendly societies, trade unions, co-operative industrial societies, philanthropic societies, employers of labour, societies of public utility, and by local authorities. Unfortunately building houses for the working classes is not attractive as an investment, and the builder alleges that the rent which they command does not yield sufficient profit. In addition to financial difficulties there are other reasons which deter the private builder, such as the effect of the Finance Act of 1910; the increase in rates which it was difficult to pass on entirely to the householder; the rigidity of the Public Health and Local Acts; war restrictions, including the Increase of Rent and Mortgage Interest Restrictions Acts, which are still unrepealed.

For these reasons it seems to Mr. Clarke inevitable that the local authorities should step in to meet the apparent shortage, if only on the grounds of public health. He is optimistic enough to think that a large mass of present-day public health activities would have been obviated if the local authorities had housed the people. This they could have done under powers they have possessed for more than forty years, but have allowed to remain dormant.

In England and Wales there are nearly a million dwelling places which consist of not more than two rooms. At least 200,000 of these are so bereft of ordinary conveniences that they ought to be demolished. According to an investigation by the local authorities in 1919 the nation needed nearly a million new houses; and Dr. Christopher Addison, then Minister of Health, estimated the immediate need for working-class houses in England and Wales alone at 500,000. In many of the existing houses families of ten or twelve persons are occupying one or two rooms; and it has been impossible to obtain conviction for overcrowding in face of the abnormal shortage of houses. The overcrowding is aggravated by the tenants of the houses taking in lodgers, often at exorbitant rents which are obtainable because of the impossibility of finding accommodation elsewhere.

Various expedients have been made to meet the house shortage. Thus in 1918 the Ministry of Reconstruction proposed a scheme by which, after a term of years, the responsibility for any excessive cost would fall upon those who incurred it. This scheme was set aside in favour of a proposal that the State should bear all the loss beyond the proceeds of a penny rate. The defect of this proposal was that it offered no substantial incentive to economy on the part of the local authorities. In addition to this the provision of a large sum of money to enable the Ministry of Munitions to purchase building material seriously inflated prices and contributed to increase the cost of houses. Under the Housing and Town Planning Act in 1919 the Assisted Housing Scheme gave a considerable stimulus to housing. But it appears that on a moderate estimate there was a loss of £60 a house per annum, the difference between the outlay and the rent including the penny rate. Consequently it was decided in March, 1921, that localities should be rationed on the basis of 250,000 new houses, and that the position should be reviewed in June, 1922, in the light of costs and results to that date. Shortly afterwards Dr. Addison ceased to be Minister of Health, and in July, 1921, Sir Alfred Mond made a statement upon the housing policy, in the course of which he said that the obligation to provide new houses rested, not on the Treasury, but on the local authorities, and expressed the hope that in a year conditions in the building industry would be stabilized, and no further Government action would be required. Thus financial stringency entirely changed the policy of the Government.

In discussing the problem of housing finance, Mr. Clarke wisely says that "although there may be sound social reasons for putting into force regulations which will prevent the free monetary expression of the law of supply and demand, all such measures, whether for restricting or raising price, are economically unsound." The capital cost of the 176,000 houses built under the Housing Acts, 1919, will approach £190,000,000; and the annual charge to the Exchequer will be approximately £8,750,000 in the early years. Consequently the Government, as representing the taxpayer, is compelled to insist upon as high a rent as possible. The high cost of these houses was due to the increased cost of labour and material; and the increase in the cost of labour seems to have been the more serious, since the percentage of labour costs to those of material rose from 50 before the war to 84 in 1920, and has descended only very gradually to 57 in 1923. At the same time the state of affairs in the matter of materials was bad enough, so that the Committee on Light Castings in 1919 reported that the association of manufacturers of such castings was restricting its output and retarding efficiency in order to keep up prices. The Committee described this course as contrary to the public interest. At the beginning of the present year a Committee was appointed by the Government to report on the extent to which in any case the price of building materials appeared to be unduly high by reason of the operation of any trade combination, trust, or agreement.

Notwithstanding his statement that interference with the law of supply and demand is economically unsound, Mr. Clarke is so much impressed by the results of the limited efforts in housing carried out by the Borough of Birkenhead, or else is so pessimistic as to the future of private enterprice in building, that he urges the Government to take prompt action. Of the 2,264 houses required in Birkenhead only about 450 will be completed under the Assisted Housing Scheme. But Mr. Clarke finds that the improved environment of the rehoused slum dwellers has undoubtedly had a beneficial effect on the character and health of the people, and that much improvement is noticed in the health of the children. For a time frequent visits by the sanitary inspector were necessary to get the people to adopt a better tone of living; but the help and advice of the inspector were gladly accepted. The indifferent or bad tenant finds himself required to live up to the standard of the other tenants; and a happy and contented home life gives a return greater than the monetary value.

In discussing next the future policy as to rehousing, the opinion is expressed that the first thing to do is to abolish the excess of State regulations under the Assisted Housing Scheme and to limit control; apparently this refers to control by the State of the activities of the local authorities, and not to the control by these authorities of the tenant. The suggestion made is that the local authority should take the subsidy, that it should use its existing officers—for example, town clerk, medical officer of health, and surveyor—and that the houses should be sold to the occupiers or others after erection, in order to relieve the local authority of the cost of maintenance. Nothing is said about the purchase price, so that it is not clear by whom the loss on the houses should be borne. In the next place, in order to prevent overcrowding, it is suggested that the medical officer of health should be empowered to require that all houses—no matter what the rent—should be reported to him whenever there is any subletting. Thirdly, any scheme of rehousing in the future must be linked up with the improvement of transport. It is useless to attempt to house some kinds of slum dweller at a great distance from their work. The problem differs in different localities, but Mr. Clarke thinks that in Liverpool a solution is to be found in transport on the surface and not by underground tubes. Fourthly, wherever possible the self-contained house is held to be the most desirable type to build. On sites where such houses would be wasteful, flats of six or eight floors are recommended, with lifts for passengers and goods, playgrounds on the roof, central heating, a café, and a social institute with a library.

Long before it became a political question exciting party strife this journal maintained that, the water supply of large towns having been put in order, housing was the most pressing public health problem, and that until it was tackled much of the expenditure of public health authorities was little wiser than that of the Winchester chapter which hid the yawning cracks in its cathedral with cement. The difficulty has always been rehousing; obviously it was useless to clear slums if the inhabitants were not rehoused, but allowed to crowd into another or to form a new slum a mile or two away.

Neither the Legislature nor the local authorities have found

a complete remedy, though something has been done, and before the war it seemed just possible that the improvement in transport, and the building of more houses and flats by private enterprise, supplemented by philanthropy and municipal schemes, would at least prevent the evil from growing. This has not happened for the reasons enumerated by Mr. Clarke, and we read on to see what remedy he had to suggest, only to be grievously disappointed, for it amounts to industrial conscription.

He maintains that the latest attempt of Parliament to deal with the shortage by means of a subsidy under the Housing Act, 1923, is not economically sound. The subsidy of £6 a house for twenty years will not meet the loss. In the race between population and houses in industrial districts population is gaining rapidly; and if all available labour in the trade were at once put on to house building the shortage would not be overtaken for twenty years. But it is stated that the number of men engaged in the industry is only 60 per cent. of the number in 1911, and continues to decline. The attitude of the trade unions is not such as to encourage an influx of apprentices. Meanwhile, abnormal conditions of unemployment exist. On these premisses Mr. Clarke argues that the nation should organize a war upon insanitary slums. He desires that this should be done by recruiting into the Royal Engineers, as Housing Battalions, all men between 18 and 25 who have done no work for twelve months and can give no evidence of any prospect of work. After a course of training the men should be drafted into a battalion ready for service, and be paid the trade union rate of wages. At the same time the Government should introduce a system of costings for the building trade as a whole.

The author of such a plan is practically compelled to urge that a scheme for building houses should be national. Mr. Clarke affirms that the country would save more than the cost of the scheme through the reduction that would be effected on expenditure on the prevention and treatment of disease, on the cleansing of streets and houses, and on policing and the administration of justice. He deplores, however, the fact that local authorities appear to discourage rather than to encourage the ownership of dwellings, and desires that the Small Dwellings Acquisition Act should cease to be optional. To enable tenants to purchase their houses he advocates the promotion of municipal banks, an enterprise which is said at present only to have been undertaken by the Corporation of Birmingham.

But as has been said, his main remedy is a form of industrial conscription, and this we cannot regard as a suggestion of any practical political importance. Mr. Clarke's paper must therefore be regarded rather as a restatement of the problem, with modern instances, than as a contribution of any immediate value to its solution.

Scotland.

THE LISTER WARD, GLASGOW ROYAL INFIRMARY.

A CONSIDERABLE amount of discussion has recently taken place regarding the possibility of preserving the ward in the Royal Infirmary of Glasgow in which Lister carried out his earliest experiments in antiseptic surgery. The buildings have been under gradual reconstruction for a number of years, and this ward was situated in the last portion of the institution to be rebuilt; the ground on which it stands is now required for the new out-patient department. Last week the managers finally decided by sixteen votes to seven to demolish this portion of the old infirmary buildings entirely. It had been strongly urged that the old walls might be retained (the ward being on the ground floor) and the new building superimposed, as a memento of Lord Lister and of the great work done during his Glasgow period (1865-69). The ward with its old fittings was an interesting survival of the early nineteenth century hospital, and its disappearance is regretted by many, including the French Academy of Medicine, as noted last week by the Paris correspondent of the BRITISH MEDICAL JOURNAL.

GIFT TO EDINBURGH ROYAL INFIRMARY.

The late Miss Jessie Aitken of Glenbervie, Larbert, left the residue of her estate, estimated at between £40,000 and £50,000, to the Edinburgh Royal Infirmary. Two-thirds of this amount, it was stated, would be held as permanent capital. Other bequests were announced, and it was stated by the treasurer that the receipts during the past two weeks had amounted to £3,431. During the two previous weeks the receipts had been over £10,945.

NEW WING FOR AYR COUNTY HOSPITAL.

The new wing of the Ayr County Hospital has just been completed at a cost of £14,000, raised entirely by public subscriptions. It comprises a children's ward, male ward, eight rooms for private patients, as well as accommodation for nurses; being constructed of steel and concrete, it is regarded as fireproof. With this extension the hospital now has accommodation for 107 patients.

DRUGS FOR NATIONAL INSURANCE PATIENTS.

At the quarterly meeting of the Edinburgh, Leith, and District Friendly Societies' Council held in Edinburgh, Dr. Matheson Cullen, of the Scottish Board of Health, in a paper on National Health Insurance, referred especially to the provision of drugs. The lecturer stated that there was a misapprehension in the minds of some persons that insured persons did not always receive an adequate amount of medicine or medicine of the best character. This impression probably arose from the fact that occasionally one heard of doctors being surcharged for what was known as excessive prescribing. Two misrepresentations in the public mind tended to continue this impression—first, that every disease must be treated by drugs, and, secondly, that every disease had its definite and appropriate remedy. In effect, however, many diseases were self-limiting, and with appropriate dieting, nursing, etc., drugs might be unnecessary. The insured person at present got every drug that was necessary for adequate treatment, often at a cost in excess of what he could himself pay. This was obvious from the fact that such a costly drug as insulin was being sanctioned and prescribed for insured persons for whom it was appropriate, and that for some such patients bills of £20 to £40 and more had been incurred in the course of a few months' treatment.

Ireland.

GENERAL MEDICAL COUNCIL IN THE IRISH FREE STATE.

THE action of the Minister of Local Government in suggesting a conference of the licensing bodies to consider the constitutional effects on the present Council of the establishment of Saorstat Eireann, has induced the Irish Medical Secretary to send a letter to the Minister of Local Government pointing out that as the general medical practitioners in the Free State were represented on the General Medical Council they should be invited to take part in the conference with the other bodies. In his reply the Minister stated that in confining the conference to the teaching and licensing bodies he had believed that these bodies were vitally concerned in any administrative action that might be decided on, but he would welcome a statement of the views of the Irish Medical Committee on the question of future arrangements for the control of the medical and dental professions; as regards the particular aspect of the subject with which the pending negotiations are concerned, the Minister is of opinion that it can be more conveniently considered by representatives of the bodies immediately concerned.

SALARIES OF ARMAGH POOR LAW MEDICAL OFFICERS.

In a recent letter to the Armagh Board of Guardians the Ministry of Home Affairs (Northern Ireland) stated that it had noted with regret that the guardians had declined to act on its suggestion to consider this question, and had evaded the matter by postponement. The Ministry did not wish to deal with the question without the co-operation of the guardians, and before taking further action urged on the Board the desirability of reviewing the salaries at the earliest possible date. After a lengthy discussion the

guardians decided to appoint a committee to consider a commencing salary for each dispensary district, and also how the difference between the initial amount and the present flat rate should be apportioned amongst the several medical officers, regard being had to the number of tickets in each district, as well as its area. The scale so arranged would do away with the Ministry's objection to a flat-rate salary.

England and Wales.

LONDON SCHOOL OF MEDICINE FOR WOMEN.

THE annual dinner of the London (Royal Free Hospital) School of Medicine for Women was held at the Savoy Hotel on December 6th, under the chairmanship of Sir Alan G. Anderson, K.B.E. The large company of more than 330 included Viscountess Rhondda, Sir Humphry Rolleston (President of the Royal College of Physicians), Dr. Mary Scharlieb, Lady Barrett, M.D., Miss Aldrich-Blake (Dean of the School), Mr. V. Warren Low, Mr. James Berry, Mr. Ernest Miles, Professor Winifred Cullis, Sir Walter Schröder, Lord Riddell, and Dr. May Thorne. The Chairman, in proposing "Prosperity to the School and Hospital," remarked on the great progress made in recent years by women in medicine, and gave an outline of the work of the two associated institutions during the past year, mentioning in particular the lamented death of Dr. Percy Saunders and the approaching retirement of Professor F. Ransom from the directorship of the Pharmacological Department. He detailed also various recent benefactors, and referred to the honours and distinctions gained by students during the year, not only in academic subjects but also in games. The health of the guests was proposed by Mr. Joseph Cunning (Senior Surgeon to the Royal Free Hospital), and responded to in a very amusing speech by Professor W. E. Dixon, F.R.S. (Reader in Pharmacology at the University of Cambridge). Professor Louise McIlroy, in proposing the Chairman's health, spoke of Sir Alan Anderson's constant championship of women and his close connexion with medicine in the persons of his illustrious mother, the late Dr. Elizabeth Garrett Anderson, and his sister, Dr. Louisa Garrett Anderson.

TREATMENT OF CRIPPLED CHILDREN IN LONDON.

At a meeting of the London County Council on December 4th a joint report of the Education and Public Health Committee was submitted of the action taken on reports made to the Council in 1921 and 1922 by Mr. R. C. Elmslie on a survey of physically defective children, and by Sir Henry Gauvain on the treatment of surgical cases of tuberculosis. The increase of in-patient accommodation for surgical tuberculosis among children was so considerable that it could now be described as adequate. The purposes to which the Council's grant to the Invalid Children's Aid Association may be applied have been enlarged, and it may now be used for the supply of surgical instruments as part of the after-care of children who have received residential treatment in institutions of the Metropolitan Asylums Board and elsewhere, and for any other suitable cases of surgical tuberculosis from the Council's schools for the physically defective. The Metropolitan Asylums Board is seeking approval for the establishment of centres in London for the clinical after-care of children discharged from approved institutions, and the question of the after-treatment of cases of deformity of tuberculous origin is being investigated. The Ministry of Health is being approached by the Council with the object of determining the best steps to be taken to secure early diagnosis and early and efficient treatment of poliomyelitis.

SMALL-POX IN THE METROPOLITAN AREA.

A case of small-pox has been reported this week at Wood Green, in the county of Middlesex. The patient had a mild and in some respects an anomalous attack. His infection was derived from Spain, where he had been on a visit. He sailed on his way home, and noticed spots on his face; it is possible that he may have infected other people during the later portion of his journey. He arrived in England on December 7th. Every precaution has been taken to limit the spread of infection.

Correspondence.

SMOKING OF INDIAN HEMP AND OPIUM.

SIR,—In several recent issues of the JOURNAL reference has been made to the smoking of addiction drugs, particularly cannabis indica and opium. Some comments seem to me desirable.

I do not believe that active cannabis indica in a form suitable for smoking can be obtained in this country. Ganja and charas are readily obtainable from most of the wholesale houses, but they are inactive when smoked—that is, they contain little or none of the toxic red oil to which the action of hemp is due. Last year I tried every sample of ganja obtainable, and not one yielded an appreciable amount of active principle on smoking. This is not surprising, because cannabinol is very easily destroyed by exposure to air and light, and crude ganja in particular rapidly loses its activity. For Indian hemp to be really active it should be freshly picked on the Himalayas and sent in sealed tins to this country; the physiological activity of such material is a revelation to the European, though, as one of your correspondents rightly says, it has little place in therapeutics.

Smoking ganja or charas, as these are usually obtained in this country, has a very unpleasant effect, not distinguishable, indeed, from smoking any dried herbs such as coltsfoot, once in vogue as a harmless boy's tobacco, and due to the pyridine, collidine, and other volatile irritating substances given off. The first effect of smoking active hemp is an intense irritation of the throat, so intense and painful that the smoking is generally stopped; this irritation, as shown by salivation, cough, and expectoration, is one of the most characteristic features of the chronic hemp smoker in the East. For this reason it is common for the pipe smoker to draw the smoke through water; this diminishes though it does not stop the irritation. The effect on Europeans of smoking active hemp mixed with tobacco is to cause in a minute or two—that is, after four or five whiffs—a feeling of exhilaration which is particularly noticeable after mental or physical fatigue; if the inhalations are continued higher control is loosened, and the subject becomes talkative and often hilarious. In less than half an hour the whole effect is over.

The Royal Commission on Indian Hemp (1884) reported "that the moderate use of Indian hemp drugs produces no injurious effects on the mind," and again, speaking of these drugs, "the Commission are of opinion that their moderate use produces no moral injury whatever." Throughout the report the suggestion crops up, though I have not found it specially stated, that excessive indulgence is the result of a mind already diseased. The Ministry of Health to my mind were right not to include hemp in the Dangerous Drugs Act, since to do so is but to call attention to a drug which from the nature of things it is impossible to use as a drug of addiction in this country, and the action of which, except to a few experts, is unknown here.

A letter on opium smoking in your issue of June 23rd (p. 1076) by Dr. Maxwell contained a criticism on an address of my own before the Pharmaceutical Society. The principal features of this letter are his amazement that I should quote the findings of the Royal Commission on Opium of 1895 and my views on opium smoking. Perhaps I may make the position clear by pointing out that morphine and allied alkaloids, unlike nicotine and cannabinol, are not volatile, and when smoked as opium are largely destroyed; one analysis of the opium smoke from a great number I gave in the BRITISH MEDICAL JOURNAL for November 19th, 1921. When opium is smoked none of the bitter tastes of the alkaloids are perceived in the mouth. The total of morphine in one pipe is probably not more than 3 mg.—that is, if twenty pipes are smoked a day only 6 cg., which is about 1 grain, are smoked—and

nearly all this is destroyed or deposited in the pipe. The smoker does not prize the opium containing the largest amount of morphine. Whatever may be the active substance produced during opium smoking—and there is much here which deserves further investigation—it cannot be simply the absorption of a negligible amount of morphine. The evil effects of excess of opium smoking are too obvious to be easily explained away.

I cannot close this letter without drawing attention to a remarkable little book by Dr. Giles, the professor of Chinese in Cambridge, entitled *Some Truths about Opium* (1923). He gives the history and some of the effects of opium in China. His views are those rather of the Royal Commission than others who periodically raise a scare in Europe. He says:

"An opium-smoker may be a man of exemplary habits, never even fuddled, still less stupefied. He may take his pipe because he likes it, or because it agrees with him; but it does not follow that he must necessarily make himself, even for the time being, incapable of doing business. Wine and moonlight were formerly considered indispensables by Chinese bards; without them, no inspiration, no poetic fire. The modern poetaster who pens a chaste ode to his mistress's eyebrow, seeks in the opium pipe that flow of burning thoughts which his forefathers drained from the wine-cup. We cannot see that he does wrong. We believe firmly that a moderate use of the drug is attended with no dangerous results; and that moderation in all kinds of eating, drinking, and smoking is just as common a virtue in China as in England or anywhere else."

My object in quoting this from the pen of a man who spent many years of free intercourse with the people as well as the officials of China is to show that even some vices may have a good side if practised with moderation. Intemperate language may be a means to an end in politics, but it has no part in science or medicine, and to overstate the case as to drug addictions can in the end serve no useful purpose.—I am, etc.,

Cambridge, Dec. 4th. W. E. DIXON.

COCAINE HABIT FROM EYE DROPS (?).

SIR,—The following case raises a question of some general interest:

A woman aged 56 recently consulted me for rapid deterioration of visual acuity in the right eye. Examination of the fundus revealed thrombosis of the superior temporal retinal vein. The right pupil was moderately dilated and fixed. A mucocele of the right lacrymal sac was present. Questioning of the patient revealed that in 1901 a well known surgeon had been consulted for a swelling over the area of the right lacrymal sac and for the condition had ordered 3 per cent. cocaine drops, to be followed in a few minutes by zinc sulphate drops. The patient never returned for further consultation as advised, but had persisted in the use of these drops twice daily ever since (twenty-two years). Considerable difficulty has been experienced by me in endeavouring to persuade the patient to give up the cocaine application and substitute a miotic, although the increased likelihood of glaucoma becoming added to the already diseased eye was explained.

The unwillingness to give up the cocaine would appear to suggest that a cocaine habit of a mild nature had been formed. Therefore it seemed to me that this case was worth recording.—I am, etc.,

F. C. PLUMMER, M.D.,
Honorary Assistant Surgeon,
November 29th. St. Paul's Eye Hospital, Liverpool.

THE ETIOLOGY OF MEASLES AND OF SCARLET FEVER.

SIR,—In the BRITISH MEDICAL JOURNAL (October 27th and November 10th) short accounts are given of the recent research work on the bacteriology of scarlet fever. The valuable results obtained by G. Caronia and M. B. Sindoni[1] are therein mentioned, together with the results reported by other authors. The results reported by Professor Caronia in his latest papers[1] [2] must be well distinguished from those obtained by others who have not supported their morphologic and cultural findings by sufficient proof, neither by serologic and immunologic tests, nor by experimental transmission of the disease to animals or—what is more important—to human beings. Professor Caronia has full right to claim that the micro-organism, first described by Di Cristina in December, 1921, and afterwards accurately studied by himself from all standpoints, is the specific agent of scarlet fever; and that the other micro-organism which he has been the first to isolate and to describe in August, 1923,[3] is the specific agent of measles.

Of the various classical and recent tests for the identification of a germ not one has failed to respond positively; all of them equally demonstrated the specificity of the germ.

The micro-organism which is constantly visible in smears from the bone marrow, from the spleen, from the scales,[3] from the centrifugalized urine,[4] and from the throat mucus of scarlet fever patients, is a very small coccus which is often united in pairs (otherwise the cocci are isolated) and can be grown in an indefinite series on anaerobic culture media (Di Cristina or Tarozzi-Noguchi type). The same organism constantly grows on these culture media when blood, cerebrospinal fluid, filtered urine,[4] filtered extract of scales,[3] and filtered nasopharyngeal mucus[5] is inoculated into them. Sufficient evidence has been brought to demonstrate that this micro-organism passes through an ultramicroscopic phase (the microscopically visible forms can be obtained by culturing the filtrate of well developed cultures).

From measles patients a similar organism can be isolated and cultivated (in the same way as before said). This micro-organism, which Professor Caronia was the first to isolate, to describe, and to prove to be the specific agent of measles, is morphologically different from the scarlet fever agent: it is Gram-negative and the cocci have a nearly round form, whereas the scarlet fever cocci are slightly oval in form and are Gram-positive.

All the serologic and immunologic tests prove the scarlet fever cocci to be different from the measles cocci. The specificity of these germs (the scarlet fever as well as the measles germs) is proved with certainty by the following facts:

1. An antigen prepared from the cultures reacts positively to the antibodies contained in the blood serum of scarlet fever (or measles) patients (agglutination, complement fixation, opsonic index).
2. Young rabbits inoculated with these cultures develop a disease which is in many features similar to human scarlet fever (or measles); redness of the skin can be detected, which is followed by evident desquamation. The blood serum of these infected animals (rabbits) reacts positively to an antigen prepared from the scales of scarlet fever patients.
3. The inoculation of carefully and duly dosed cultures, to children in anergic state, is followed by an attenuated form of scarlet fever—or of measles. Through this attenuated form of the disease the children acquire a definite immunity. These experiments, which have always been governed by the main thought of doing no harm, and were done in children only after they had been proved to be quite harmless (the authors previously inoculated cultures of the scarlet fever agent to themselves, developing a very attenuated form of scarlet fever), were never followed by any ill consequences.
4. The inoculation of dead cultures to healthy children has an immunizing effect; these children, though kept in close contact with scarlet fever patients, do not develop the disease; their tonsils can be harmlessly swabbed with the nasopharyngeal discharge of sick children in the rash period.

This success in vaccinating children by means of dead cultures, besides being an important proof of the specificity of Di Cristina's and of Caronia's germ, is a result of the utmost importance. In diseases so serious and frequent as scarlet fever and measles it is essential that the value of a preventive vaccine of so great an efficiency should be generally acknowledged. Doubt is no longer possible as to the vaccinating efficiency of killed scarlet fever and measles cultures. In our clinic scarlet fever and measles patients are kept in the same room and in neighbouring beds; in some months some hundreds of children have been thus kept in our clinic after having been vaccinated against the disease—the scarlet fever children against measles, the measles children against scarlet fever—and no child has contracted the other disease. All members of the families to which a scarlet fever child belongs have always been vaccinated against the disease, and the vaccine has never failed to protect the grown-up people as well as the children against the infection.

Evidence of the prophylactic efficiency of the vaccine has already been brought from many parts of Italy where scarlet fever epidemics have in these last months been noted; many families of sick children and all scholars of some infected schools have been there vaccinated. The experiments of Professor Caronia have already been supported by the evidence of various authors, and are to be repeated by French and German investigators.—I am, etc.,

Clinic for Children's Diseases, R. POLLITZER, M.D.
University of Rome.

[1] Caronia e Sindoni, *La Pediatria*, xxxi, No. 14, July 15th, 1923.
[2] G. Caronia, Ibid., xxxi, No. 15, August 1st, 1923.
[3] M. B. Sindoni, Ibid., xxxi, No. 16, August 15th, 1923.
[4] P. Ritossa, Ibid., xxxi, No. 17, September, 1923.
[5] G. Vitetti, Ibid., xxxi, No. 18, September 15th, 1923.

PIGMENT AND CANCER.

SIR,—May I be allowed to endorse the opinion of Sir George Beatson (December 1st, p. 1066) as to the importance and value of the Bradshaw Lecture on melanosis by Mr. W. G. Spencer? It is very probable that a definite knowledge of the mode of origin of pigment would be most helpful in ascertaining the nature of melanotic cancer.

Spencer considers, as did Beatson in his paper on the possibility of a pigmentary origin of cancer (*Lancet*, 1922, ii, p. 655), that melanin pigment is not derived from haemoglobin; though it is interesting to note that the latter, in his letter, regards nutrition as a primary factor in its production, and refers, moreover, to the admitted connexion between chlorophyll and haemoglobin. I have recently endeavoured (*Journal of the R.A.M.C.*, October, 1923) to revive the view formerly in favour that pigment is derived from haemoglobin—as a product of haemetaboly on the part of epidermal cells. It is known that various chromogen groups are contained in or can be obtained from haemoglobin.

In melanotic cancer I would consider the pigment production a concomitant result of increased and modified haemetabolic activity on the part of the cancerous cells rather than as the exciting cause of the growth. One or two observations brought forward by Spencer appear to me to militate against Beatson's view: namely, (*a*) that horses which keep their hair dark—that is, strongly pigmented—rarely suffer from melanotic cancer; and (*b*) that even though melanomas are very common among darker human races (to which may be added the fact of their pigmented skin), yet melanotic cancer is apparently very rare among such. If pigmentation were concerned in the causation of these growths, should we not expect to find them occurring particularly in these two groups?

Spencer points out that cancer tends to arise in the areas of pitch-black pigmented skin, but only in grey horses which are turning white with increasing age—that is, in which pigment production generally is failing. I would suggest that the development of the malignant behaviour in such cases may indicate a biological reaction on the part of the cells concerned to an excessive degree of pigment production, correlated with the general failure of this haemetabolic function elsewhere. Nor is this reaction probably limited to the epidermis, because I think there can be little doubt, from Acton's recent work, that dermal cells can themselves also produce pigment—normally as well as abnormally. In the case of one or both of these types of cells this particular function becomes changed, at any rate largely, into one ministering directly to their growth, nuclear increase, and resultant proliferation. In other words, I agree with Dr. Charles Creighton that such cells have become cancerous because they have taken to living on the blood elements.

On the other hand, again, in white peoples, the normal haemetabolic function of pigment formation is very largely in disuse (customarily) as regards the general epidermis. Pigmented naevi indicate, I would say, an (abnormal) exceptional retention of this property; already there is a tendency on the part of certain cells to the exercise of this special form of haemetaboly in unusual degree. Such cells, therefore, may in the circumstances be particularly liable to go a step further and develop malignant behaviour.—I am, etc.,

London, S.W., Dec. 4th. H. M. WOODCOCK.

CANCER AMONG NEGROES.

SIR,—From time to time I notice in the JOURNAL references to cancer among negro races. Some seem to assume that it does not exist. I had imbibed that theory, and hesitated to remove a tumour that had all the appearance of an early scirrhus of the breast. I was away from the station (Bandawe, Nyasaland) for some time, and when I next saw the patient the tumour was inoperable. It ran an uninterrupted course, completely destroyed the breast, then the soft structures of the chest wall, and then ate through the ribs; when I last saw the negress in her village I could see the heart pulsating. That was just before her death. I have since made it a rule to excise all mammary tumours whenever the patient will agree. I have also seen epithelioma of the face. In this case the eyelids and the whole of one eye were completely destroyed, and the bone of the eye socket was attacked; the case was inoperable. I have seen a tumour, fungating and evidently malignant, that had practically split the bones of the face, causing the eyes to bulge laterally and giving a strange chameleon look to the patient. It was inoperable. I have seen cancer of the left ovary that proved fatal. I believe I have seen cases of malignant disease of the liver, but as there was no autopsy the diagnosis was not confirmed. I have removed many large tumours of the testicle which, if not cancerous, are of a nature unknown to me. Keloids and fatty tumours are very common.

Cancer of the lip or mouth I have never seen. Natives cook their food in earthen pots without handles, and as these pots have to be lifted between the two hands I doubt whether the food is ever so hot as we Europeans cook it. It is always allowed to cool a little before it is divided out for eating. The throat cancer attributed to hot rice among the Chinese is not seen here. They are inveterate smokers, but they do not smoke as Europeans do. They do not go about with an irritating pipe stem between the teeth or a cigarette between their lips. The fashionable pipe supplies a cool smoke. The lips are everted and applied to the end of the pipe like a rubber suction plaything one sees children with at home. One wonders where the smoke is going. Then there is a deep grunt of satisfaction. The pipe is removed, the end wiped carefully, and passed on to the next. But you watch number one, who sits till there is a dazed look in his (or her) eyes and then smoke emerges slowly from the nose like peat reek from a lum. Where this has been accommodated is a source of wonder. But the native has got full value from a very economical portion of tobacco and there has been no prolonged irritation of the lip.

If there is a relative immunity to cancer I do not think we can attribute it to the absence of a meat diet. The negroes, when they can get it, eat far more meat than the white people. There is no limit to the variety or the condition, and some might wonder whether there is a limit to the quantity. They are only vegetarians when there is nothing else to be had. Anything from a fieldmouse to an elephant is welcomed. The meat may still be warm when thrown on the ashes to cook, or it may be so old that the maggots have to be beaten out of it. Even the skin of a hippopotamus is stored away and cooked when other meat is scarce. It makes a dish something like a jelly. My native carpenter calls it "glue." I do not think we can attribute even relative immunity to the lack of a meat diet.

There is one element in modern life of which the white races have more than their share, but which is an almost complete stranger to our coloured friends. That is *worry*. Most of us have seen malignant disease follow periods of great grief or prolonged worry. The negro does not worry. His grief may be acute, but it is brief, and there is no attempt at repressing the emotions. A mourning for the dead means a flood of tears while it lasts. In that there is relief. May not suppressed emotions and the prolonged worry associated with so many callings in life at home be determining factors?

At present we have no reliable vital statistics. The causes of death among the bulk of the population of our African dependencies are still to be investigated. An outbreak of sleeping sickness arrests attention, as does an epidemic of small-pox. But the bulk of the people die and are buried without any medical man making any inquiry whatever.

There is immense scope here for medical men who have the time and the talent to devote themselves to the study of disease. A medical missionary may find a maternity case and a cataract case only incidents in an already overcrowded day. We find microscopic work on the blood, stools, and urine too captivating to allow of our studying the gross pathological conditions. But there is immense scope for the pathologist, and a very interesting field for investigation would be the tumours affecting natives.—I am, etc.,

Kasungu, Nyasaland, Sept. 17th. GEORGE PRENTICE.

ANATOMICAL NOMENCLATURE.

SIR,—With your reviewer's opinions of my *Practical Anatomy*, published on September 8th, I have no quarrel, nor have I any interest in his restatement of the mid-Victorian conceptions of the relationships of anatomy to medical science. His remarks on anatomical nomenclature call, however, for some comment.

It may be readily admitted that the present position of anatomical nomenclature is chaotic and reflects little credit on the profession or on professional anatomists. Prior to the introduction of the Basle nomenclature in 1895 there were about 30,000 names, duplicates, and synonyms employed in human anatomy. The Basle commission, by insisting on the principle of one structure one name, reduced these to about 4,500, and at the same time suggested that related terms should, as far as possible, be similar; thus, femur, femoral artery, femoral vein, femoral nerve. It is neither logical nor scientific to retain "femoral" for the vessels and "anterior crural" for the nerve. Similarly the main nerve trunks of the superior extremity—an adjective open to objection—were renamed from their positions—radial, medial, and ulnar; and hence, to the consternation apparently of the older generation, the term "musculo-spiral" disappeared. Had your reviewer read my preface a little more carefully he might have realized that I do not regard even the B.N.A. as the last word on anatomical nomenclature. I merely adopt it, because it has been almost generally incorporated into practically every modern anatomical textbook in the English language, as it is the only standardized, international, scientific, and uniform terminology we possess, and it is not even necessary to employ the original Latin names, as all or nearly all are easily translatable into one's own tongue. Your reviewer imagines that a small band of die-hards are going to impose what they are pleased to call an "old terminology"—that is, a chaotic freedom to call any structure in the human body anything one pleases—on the scientific members of the profession all the world over. He is offended by seeing "'hilum,' the abbreviated form of nihilum, consistently spelt 'hilus,'" which he apparently attributes to ignorance. He does not appear to be aware that it is really the other way about—"nihilum" was derived from "hilum"; and in any case, the Basle commission, which included, I believe, Sir William Turner, Professors D. J. Cunningham, G. D. Thane, and some 120 other non-German European members, dropped "hilum" entirely, and substituted "hilus" in accordance with another of their general principles—that every term should be philologically correct, and as short and simple as possible.

Very unfortunately, as I think, the Basle commission sanctioned two series of descriptive terms, the one only applicable to the human body, the other equally applicable to all animal forms. Your reviewer prefers the former; I the latter. On this point I hold the strongest views. To say that "the transverse colon is in contact cranially with the liver and gall bladder" is "un-English" is ridiculous. Presumably your reviewer would have preferred some such term as "above" or "superiorly," ignoring the fact that such expressions are not here equally applicable to the embryo or the quadruped. Is it to be imagined that it is to-day possible, or even desirable, to teach human anatomy to medical students without constant reference to embryology, comparative anatomy, and even pathology—that is, normal anatomical relations as disturbed by disease? What other term but "cranial" is equally applicable, equally scientific, and equally intelligible? A precise science should have a precise language, and such expressions as "above," "beneath," and "behind" leave the reader constantly guessing as to what the author really does mean.

Surely the time has come, if indeed it is not long overdue, for English-speaking anatomists to determine finally their own nomenclature. Aided by the physiologists and the clinicians, who have to use our terminology, we might even yet arrive at a mutually satisfactory nomenclature which shall be of general applicability, and, at the same time, be precise, concise, English, and scientific. To decry the B.N.A., because it is, not altogether correctly, described as of foreign origin does more credit to the heart than the head, and, in any case, the fact that the basal science of medicine speaks to-day in two different languages and with two different voices is unworthy of British anatomy. Is it too much to ask those who can do so to put matters right?—I am, etc.,

RICHARD J. A. BERRY.

University of Melbourne, Oct. 25th.

THE USE AND ABUSE OF OBSTETRIC FORCEPS.

SIR,—I hope that this comment on the discussion as to the use and abuse of obstetric forceps will reach you before the subject has become stale or the correspondence on it been closed owing to the violent passions aroused. It seems to be one of those medical questions which touch us all too nearly to allow of its being discussed with the necessary scientific detachment. My own experience in the obstetric art is gained from abnormal cases among Asiatic slum dwellers—Chinese, Malays, and Tamils. As the national customs of these races strictly forbid the presence of a male unbeliever in the lying-in room of their women folk, it will readily be understood that I only attend those confinements which show some definite abnormality. By far the most common symptoms for which I am called in is delay in the second stage, due to the simple atonic inertia to which these anaemic malaria-ridden mothers are subject. In former days it was my practice to apply forceps in nearly all these cases, using every care to avoid damage and carefully repairing what I did do. I get very much better results now from an injection of pituitrin, surely the busy obstetrician's best friend. A point which surprised me in the discussion was the opinions expressed as to what constitutes serious delay in the second stage. My first question to the importunate messenger sent to call me is, "How long is it since labour pains came on?" It is only rarely that the period stated is less than twenty-four hours, and three days is quite a common answer. The oedematous condition of the genitalia and the general condition of the patient usually bear out the statement. Yet, if the mother is not up and about her usual avocations two days later the husband is apt to regard both the practitioner and the mother as dismal failures.

The squatting position is used by most Asiatics, and in reply to Dr. Fairbairn's question as to its efficacy I would say that it largely depends on the state of the abdominal musculature. Given a multipara with a flaccid abdominal wall there is a tendency for the heavy uterus to fall forward early in labour and the expulsive powers then tend to spend themselves in a wrong direction. I well remember the case of an elderly Tamil to whom I was called after she had undergone two days of the ministrations of a local handywife. The labia were greatly swollen and oedematous and bleeding from tears made by predecessors—for your native accoucheur regards the vulva as the only obstacle in such cases—and the uterus projecting forward over the pubis. On putting the patient in the dorsal position and making a little gentle pressure on the fundus the child was delivered at once and without difficulty.—I am, etc.,

Sungei Siput, N.,
Perak, Federated Malay States, Nov. 5th. G. WAUGH SCOTT.

DIFFICULT MIDWIFERY IN GENERAL PRACTICE.

SIR,—For some reason or another the general practitioner is extraordinarily sensitive to anything which he can construe as criticism of his midwifery. A resentful attitude was obvious at the Portsmouth meeting, in regard to which your leading article of October 6th remarks that "a querulous note did appear to find its way into the discussion."

The correspondence on Dr. Luker's address illustrates this seemingly inevitable effect of papers by obstetric specialists upon general practitioners. It is the natural tendency of every animal (including specialist and G.P.) to defend itself when attacked, and we have a letter from a practitioner giving the *tu quoque* ripost of "*You* don't know *your* job," in the shape of the proposal that "practical midwifery should be taught by a general practitioner and not by a specialist," and one from a consultant explaining the point of view of those engaged in hospital practice and teaching. I would supplement what Dr.

Russell Andrews says and make a plea for mutual co-operation and support in a common task.

Let us both quit recriminations and recognize that the matter will appear different if looked at from a different standpoint. The first question we all have to ask ourselves is, Are we satisfied with the maternity service of the country? Satisfaction with the present results can only be explained by incapacity to see things as they are, and hence the further question follows, How can these results be improved? There is no room for complacency, for our attention is constantly being directed to the failure to lessen the child-bed mortality and invalidity, the stillbirth rate and the neo-natal mortality (resulting largely from ante-natal disease and prematurity and from complications in labour and birth injuries).

For its new lives the nation has to pay the price of about one maternal death for every 275 children born alive. The price varies from year to year, but there has been no striking or permanent fall; in the last ten years it has varied from a lowest of one mother for 282 (in 1918) to a highest of one mother to 243 births (in 1919 and 1920). Contrast these figures with the remarkable drop in the infantile mortality rate, which, after being almost stationary for many years, has been halved in the course of the twenty-two years of this century. Surely the death of one mother for 500 or 1,000 births would be a heavy enough price for the natural function of reproduction, the greater part of the mortality of which is preventable—if so, why is it not prevented?

Once it is recognized that all is not well with our maternity service, the next step is to put our heads together to remedy it, and to obtain a diminution in the maternity figures equivalent to that obtained in infantile mortality. The experience is required of officers of maternity hospitals and gynaecological departments, of research workers, and medical officers of health, and of those practitioners with knowledge of the conditions under which domiciliary midwifery is conducted and of how these conditions can be improved. If this correspondence can pass from girding at teachers and specialists to some constructive proposals as to what can be done to forward this overdue betterment of our maternity statistics, it would be the best possible augury for the future.—I am, etc.,

London, W., Dec. 10th. JOHN S. FAIRBAIRN.

SANITATION IN INDIA.

SIR,—In your issue of November 17th (p. 933), in a note under the above title, you refer to *McNally's Sanitary Handbook for India*, which has been ably brought up to date by Major A. J. H. Russell, I.M.S., Director of Public Health with the Government of Madras. You commend to notice a "valuable suggestion, applicable to other countries besides India, is that the rudiments of hygiene should be taught in all elementary schools." The usual necessity for economy of space in editing a new edition of a book probably prevented Major Russell from calling attention to the fact that this desirable requirement has long been fulfilled in at least one portion (143,000 square miles) of India—namely, the Madras Presidency. In 1879 the Government of India bestirred itself on the subject by offering an honorarium for "the best English sanitary primer for instruction of the natives of India in elementary hygiene." I believe that Surgeon-Major J. A. Laing, I.M.S., then Inspector of Vaccination, subsequently officially suggested adoption of the subject in schools in the Madras Presidency. The Director of Public Instruction, Madras Presidency, in his letter 3491 of 1914, states that hygiene was taught in schools "apparently before 1880," that "it had not been rendered compulsory, but is, as a matter of fact, generally taught in elementary schools to-day, apart from specific pamphlets for information and instruction in the unhygienic influence, for example, of flies, malaria, etc." Whilst it was not feasible for the Director to state, without special inquiry, the total number of many thousands of scholars attending these schools who had formally accepted instruction in the subject, he added that between 1893 and 1914, 2,755 and 1,876 appeared for the elementary and intermediate grade examinations respectively under the Government technical education scheme.

Press statements referring to the recent adoption of medical inspection of schools in the Madras *City*, where (in virtue of an *imperium in imperio* policy) sanitary advance has notoriously lagged, have rendered it possible to conceive that this also is an innovation in India. This is not the case. In the Madras Presidency sanitary inspection of all schools and colleges supported or aided by Government or public bodies was, to my personal knowledge, a well accomplished routine duty of district medical and sanitary officers from 1886 to 1905, and presumably is so—with modification as to staffs—up to date. This valuable method was sanctioned by the Madras Government on the advice of the late Surgeon-General Bidie, C.I.E.

A similar misapprehension has attended the tardy introduction by the Corporation of Madras of placing at disposal of the public the attendance of qualified midwives. Yet, following an order of the Madras Government in 1862, midwives for public and private practice have been educated and afforded certificates of qualification after examination. Outside the Madras City limits both municipalities and district boards have utilized them freely. With some self-gratulation the Corporation within the last three years has started a baby welfare scheme. Yet the Government of Madras (referring to the recommendation of their sanitary commissioner of 1905) urged its adoption in 1906, in the presence of great infantile mortality. The Corporation of this large city in sanitary matters "hasten slowly."—I am, etc.,

W. G. KING,
Colonel I.M.S.(ret.).

London, N.W., Dec. 10th.

THE NERVOUS CHILD.

SIR,—Many years of observation have convinced me that, while there are doubtless predisposing factors in the quality of tissue inherited by the type of nervous child depicted by Dr. Cameron (November 24th, p. 963), the first exciting cause is usually disturbance in the character and distribution of the intestinal flora; its exact nature has been studied by Herter and other pathologists. Clinically, its commonest manifestation is chronic gastro-intestinal catarrh with recurrent febrile exacerbations, but all the mucous membranes of the body are apt to be affected. In other words, this type of nervous instability is a graft on the "catarrhal diathesis." Dr. Cameron duly notes this association, but the special opportunities of a family doctor have enabled me to observe that the order of precedence is invariable—the catarrh comes first. There appear to be two proximate causes of this catarrhal disposition. First, the excessive ingestion of carbohydrates; secondly, exposure to damp (especially by living on damp soils) of children whose family or racial antecedents underwent evolution under drier conditions. Examples I would quote are blonds, Jews, or derivatives of undisturbed rural communities long-settled on permeable subsoils—for example, the new and old red sandstones of Devon. These and others of the kind seem to lack resistance to the infection of mucous membranes on the heavy clay soils that serve for many urban sites or when they reside in river valleys or other humid districts.

The immediate result of the engendered catarrh is the absorption of toxins causing, among other symptoms, a general muscular flabbiness. In these circumstances the child's heavy head cannot be held well poised on the spine—it tends to tilt forwards, causing the spine to curve and the shoulders to droop. To compensate for this the pelvis is swung forward in its turn, and the result is the stance described and illustrated by Dr. Cameron. By the time this unfortunate state of disturbed digestive functions, malnutrition, toxic absorption, endocrine perversion, and muscular hypotonus is established the child usually finds itself immersed in the atmosphere of perpetual concern, remonstrance and exhortation so well set forth by Dr. Cameron. Even if the parents are wise and the family history sound, the child may find itself in a condition of nervous tension through its efforts, despite fatigue, to please them or emulate other and healthier children. There is therefore small cause to wonder that psychic maladjustments are added to the other troubles.

Satisfactory treatment of these cases is often very difficult because not only the child but also his environment

(including relatives) have to be dealt with. Adequate therapeutics are opposed or rejected on the plea of expense, difficulty, or on other plausible or reasonable grounds, and the child is apt to grow up, as I have been long enough in practice to observe, into the doleful type of invalid known comprehensively as the "abdominal neurasthenic," with his flatulence, constipation, mucous colitis, enteroptosis, etc., and the neuroses or psychoses that accompany these woes.

Enlarged tonsils and adenoid growths need prompt removal because they serve as reservoirs of pathogenic organisms at the portal of the respiratory and digestive tracts and greatly aggravate the whole condition, but they are a result and not a cause of the catarrhal state. Remedial exercises, directed with knowledge and experience, are serviceable in correcting the faulty posture, flat-feet, etc., but their utility is much limited unless the defects of the environment are adjusted.

A thorough understanding of child psychology and psychotherapy is also needed, for the "sense of inferiority" is all too readily acquired, as are also the various "fixations" and "complexes" that impede or pervert psychic development.

The root of the matter appears to me to be that the simple traditions and cruder eugenics that served our forefathers, and foremothers, for guidance in the rearing of children no longer suffice us. They were all very well in the days when families were large and the devil took the hindmost, or when generation after generation had bred in the same environment and effected stable adjustments by cumulative acquisitions of mother-wit. We are dealing largely now with the huge, floating, heterogeneous populations of the industrial era, and new and more complex traditions must be devised to meet the needs of a more complex civilization and to give the individual a better chance of satisfactory adjustment to his environment.—I am, etc.,

J. STEWART MACKINTOSH,
Hampstead, Nov. 29th. M.D., M.R.C.S., L.R.C.P.

HYPOGLYCAEMIA AND EPILEPSY.

SIR,—The use of insulin in the treatment of diabetes mellitus and the discovery that an overdose may produce signs and symptoms of an ordinary epileptic seizure lead me to ask whether we have not here, perhaps, some clue to the cause of epilepsy itself.

It would appear that it is the hypoglycaemia induced by an overdose of insulin which is the causative factor in the epileptiform attack, for insulin does not appear to have any other pronounced effect on the blood stream. At least there is no evidence that it produces either an anaemia or a hyperaemia of the brain. It is, at least, a possibility, therefore, that it is the reduction of the blood sugar below a certain percentage that produces the epileptiform seizure. If this be so, one feels justified in asking whether the cause of true epilepsy may not yet be found to be either a persistent or a recurring hypoglycaemia. I am carrying out some observations in a small way, but investigation by one engaged in general practice is necessarily difficult. I would suggest for those with more leisure and greater scope that investigation along the following lines will at least prove of interest.

(1) Does the examination of the epileptic during a normal state of health reveal any abnormality in the percentage of blood sugar—for example, is there a tendency normally towards a hypoglycaemia?

(2) During the seizure itself is there any evidence of a hypoglycaemia?

(3) Does autopsy reveal any abnormality of pancreas—for example, hypertrophy of the islands of Langerhans; or does it show any atrophy of other antagonistic glands?—I am, etc.,

Whitehaven, Nov. 24th. J. W. MACKAY.

ATTITUDE IN CATHETERIZATION OF THE BLADDER.

SIR,—I am inclined to think that the answer Dr. Bamber gives to the question he asks (November 17th, p. 947) is not quite complete.

I have noticed repeatedly when passing a glass catheter in women in the supine position for distended bladder that, when the pressure with the hand above the pubes is relaxed and the bladder is nearly empty, the direction of the flow through the catheter is reversed. This suggests to me that a negative pressure then exists within the bladder owing to the bladder muscle failing to contract.

If this is the case in a healthy bladder which has been temporarily distended, how much more would it not be the case in the male bladder, which can never be emptied spontaneously. It will generally be found necessary to express the contents of the bladder by pressure above the pubes if the patient is in the supine position, and if the pressure is relaxed before the catheter is withdrawn, unless the finger has been previously placed over the end of the catheter, air is liable to enter.

When the catheter is passed in the sitting or standing position, it is usual to depress the external end; hence the bladder is emptied by siphonage, and the degree of suction corresponds to the difference between the height of the eye and that of the external opening of the catheter, and as long as the latter is kept on a lower level than the former air cannot enter.

The presence of air in the bladder gives rise to a condition favourable to the growth of certain bacteria which in its absence would not flourish. The urine in cases of cystitis the result of catheterization is commonly alkaline, and everyone will recall how rapidly urine undergoes alkaline decomposition in warm weather. It would therefore appear to be more satisfactory to empty the bladder by siphonage than by expression. This can easily be done in the recumbent position by attaching a foot or two of thin rubber tubing to the end of the catheter and letting it hang over the side of the bed. It is necessary, however, to use a catheter with multiple eyes, as a single eye might adhere to the bladder wall by suction, and so become obstructed.—I am, etc.,

Westcliff, Essex, Dec. 2nd. T. BRICE POOLE.

VACCINATION PROPAGANDA.

SIR,—Mr. T. F. Manning (JOURNAL, December 8th, p. 1122) says that "the great flaw in Dr. Millard's argument is his assumption that every attack of small-pox in an unvaccinated person would be so severe as to lead to immediate diagnosis," and he instances the experience of the ultra-mild small-pox which has recently prevailed in the North and Midands as disproving this.

I tried to make it clear that my contention only applies to the severe or Asiatic type of the disease. I quite admit that it does not apply when we are dealing with the American or alastrim type. But the point is this: so long as the mild American type breeds true we are, for all practical purposes, dealing with a different disease from the terrible and fatal scourge to fight which vaccination was first introduced and made compulsory. I venture to assert that if it had only been the American type of small-pox which prevailed in Jenner's day and subsequently he would never have been voted £30,000 by a grateful Government, nor would the compulsory vaccination law ever have been passed! On the other hand, should the American type of small-pox now occurring in this country cease to breed true—though so far it has shown no inclination to do this—then the difficulty of diagnosis in unvaccinated subjects would also cease.

It is a surprising and disconcerting fact, but none the less I believe it to be true, that under modern conditions the Asiatic type of small-pox tends to be spread rather by vaccinated persons, whilst the American type tends to be spread rather by the unvaccinated. Or, to put it another way, under modern conditions vaccinated persons tend to spread a severe type of small-pox, whilst unvaccinated persons tend to spread a very mild type.—I am, etc.,

Leicester, Dec. 8th. C. KILLICK MILLARD.

SUPRAVAGINAL HYSTERECTOMY AND PANHYSTERECTOMY.

SIR,—I opened this week's JOURNAL in the full expectation of finding a letter from Dr. Herbert Spencer on the above subject, nor was I disappointed. I think, however, further discussion would be better left over until I have published my paper in full.—I am, etc.,

Manchester, Dec. 10th. W. FLETCHER SHAW.

Obituary.

SIR FREDERICK TREVES, BT., G.C.V.O., F.R.C.S.,

Consulting Surgeon to the King; Consulting Surgeon, London Hospital.

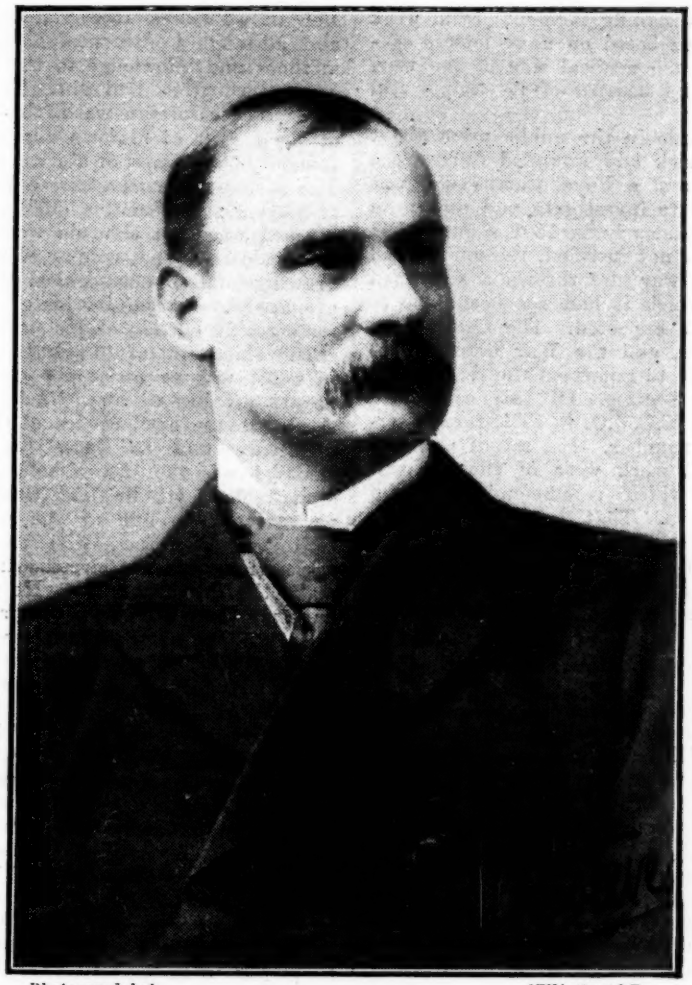
THE death of Sir Frederick Treves on December 7th will come as a surprise to his many friends. He had passed through a severe attack of pneumonia last year, but seemed to have recovered. He had lived for some time in Switzerland at Evian, on the Savoy side of the Lake of Geneva. This autumn he moved to Vevey, on the Swiss side, where he had just established himself in a flat when he was taken ill on December 3rd; his death, which was due to peritonitis, occurred in a nursing home at Lausanne.

Frederick, the son of William Treves of Dorchester, who married Jane, daughter of John Knight of Honiton, was born on February 15th, 1853. His early education was received at Merchant Taylors' School; after studying at University College, he entered the Medical School of the London Hospital. He took the diploma of L.S.A. in 1874, and passed the M.R.C.S. examination in the following year. After holding the post of resident assistant surgeon to the Royal National Hospital for Scrophula (as it was then called) at Margate, and filling several junior resident posts at the London Hospital, he, in 1877, began general practice in Wirksworth, Derbyshire, in partnership with Dr. William Milligan. He passed the final F.R.C.S. examination in 1878, and in 1879 was appointed surgical registrar and assistant surgeon to the London Hospital, and acted as demonstrator in physiology as well. He was also clinical assistant to the Royal London Ophthalmic Hospital. He began to teach anatomy instead of physiology at the London Hospital in 1880 and acted as demonstrator in anatomy and lecturer in practical anatomy until 1883, when he became full surgeon and succeeded Mr. Rivington as head of the anatomical school. The light of his inquiring, original, and observing mind was not one to be hidden under a bushel, and he soon attracted notice as a surgeon and as a teacher of anatomy in a much wider field than his own hospital. He gave the Erasmus Wilson lectures in pathology at the Royal College of Surgeons in 1881. Two years later he published his epoch-making work on surgical applied anatomy, and gained the Jacksonian prize of the College for an essay on intestinal obstruction.

When Treves was appointed assistant surgeon to the London Hospital, intestinal surgery was in its infancy; the problems which it presented could only be solved by a combination of boldness and sagacity, resting upon a fresh investigation of the anatomy of the abdominal organs regarded from the new point of view. By his writings on these subjects and by his example as a practical surgeon he had a large share in placing this department of surgery on a sound basis.

In 1885 he was Hunterian Professor of anatomy in the Royal College of Surgeons and delivered four lectures on the anatomy of the intestinal canal and peritoneum in man, which were published in a book issued in the following year. The lectures were based on a careful examination of 100 bodies, and the result of his researches was that many theories and statements then commonly found in textbooks were badly shaken.

In the nineties Treves was the best known and most successful of London surgeons and his success was due to a variety of causes. In his systematic lectures on anatomy and (later on) surgery, he was an impressive teacher, who at the same time interested his class and maintained discipline. Few men worked harder at his public and professional duties than he. Until his private practice became very extensive he regularly attended the hospital on Sundays to examine the cases in his wards more thoroughly and at greater leisure than he could with an immense following of students and visitors from all parts of the world, and he would then go for a forty or fifty miles' cycle ride. With the students he was always immensely popular, and for many reasons; an athlete himself and a certified master mariner, he could excel them in nearly any feat on land or sea. They recognized his ability, surgical skill, and above all his extraordinary powers of work and virility. The portrait we reproduce by the courtesy of the secretary of the London Hospital Medical School shows him at this stage of his career. He was at the head of every meeting and movement of the students, and was the main instrument in affiliating all the students' clubs into a Students' Union, of which he was appropriately the first president. A man of such powers naturally had a commanding voice in the counsels of his colleagues, and until pressure of his work compelled him to retire from the active staff he took an important share in the management of the medical school, and for nearly twenty years was a member of the College Board.



Photograph by [*Elliott and Fry.*

FREDERICK TREVES,
WHEN SURGEON TO THE LONDON HOSPITAL.
(By the courtesy of the Secretary of the London Hospital Medical College.)

Hard work alone will not command success, but in Treves it was combined with a quality of trustworthiness and steadfastness resting on the true self-reliance of knowledge and experience. Those who observed him in the wards of the hospital, at an operation of difficulty or danger, or at a "sing-song" of medical students, never saw him embarrassed or ill at ease. A sense of humour, rarely absent in those who rise to eminence, the power of public speaking associated with a happy and picturesque turn of phrase and word, always placed him in sympathy with his audience, whether at a scientific meeting, a dinner, or at a students' gathering.

Commanding such widespread confidence, his appointment to be a civilian consulting surgeon in the Boer war (1899) gave great satisfaction. In previous Continental wars

leading civilian surgeons had co-operated with the army medical staff, and the outbreak of war consequently secured the assistance of Sir William MacCormac, then President of the Royal College of Surgeons, Mr. Treves, and Mr. Makins. Treves sailed for South Africa at the end of 1899 and was attached to Buller's army in Natal. As consulting surgeon with the Field Force he was present at the battle of Colenso and throughout the comparatively prolonged operations which resulted in the relief of Ladysmith, which he visited as soon as he could get in.

The Tale of a Field Hospital (1900) described the work of No. 4 Stationary Field Hospital during the three months for which it formed part of the Ladysmith Relief Column. Treves was attached to this unit and had written a series of letters to this JOURNAL describing incidents from week to week. The book which was based on these letters contained a striking picture of the medical side of the war, all the more vivid and moving because of its simple and unpretentious character.

Many charges had been made in the public press about the inadequate care of the sick and wounded during the earliest months of the war, and a Royal Commission was sent to South Africa in 1900 to investigate and report on the charges. Its report issued early in 1901 showed that while most of the charges were not justified, the unexpected severity and duration of the war had thrown a strain on the Army Medical Service which it had not been able to stand as well as it had been expected. The Commission recommended certain changes, and the War Office subsequently appointed a committee to report on the reorganization of the Army Medical Service. Of this committee Treves, who had been created K.C.V.O. in 1901, for his services during the war, was a member. His recent personal experiences of army medical work were of the greatest service to the committee, which recommended certain changes; these were carried out. That they were judicious was proved when in 1914 the Royal Army Medical Corps was submitted to the supreme test of the great war.

Treves served successively as Surgeon Extraordinary to Queen Victoria, Serjeant Surgeon to King Edward VII (1901), Surgeon in Ordinary to George, Prince of Wales, and Serjeant Surgeon to King George V. It was while holding the second of these appointments that the eyes of the Empire and of the whole world were directed on him during the anxious days of King Edward VII's sudden illness in June, 1902, on the eve of his Coronation. The sudden announcement at 10 o'clock on the morning of Tuesday, June 24th, that the coronation of the King, fixed for that week, was postponed through the necessity of an immediate and serious operation, fell like a bombshell on the nation, for the public generally thought that the King was quite well as he had been, apparently, going about as usual and had moved from Windsor to London the day before. It soon became known that the operation was for the relief of an abscess about the appendix, and when it was further known that Treves was to undertake it the national alarm was greatly calmed. In an hour or so it was further announced that the operation had been successfully performed and that the King was doing well. It was not until some days afterwards (July 5th, 1902) that we were able in the JOURNAL to give an explanation of the suddenness of the illness and the need of the operative treatment. It was then seen that the King had been suffering from June 13th from abdominal pains, but that he had kept up and filled important engagements in the hope that the symptoms would pass off and that the Coronation would not be interfered with. It was recognized from the first by Sir Francis Laking and Sir Thomas Barlow that the appendix was the cause of the trouble, and Treves was called in on June 18th. The King was most anxious that the Coronation should take place on the appointed day, and held on in spite of the uncompromising advice Treves gave as a surgeon. The symptoms subsided somewhat and the King was able to travel to London on June 21st, but that evening the swelling in the right iliac fossa reappeared in more marked form and the temperature, which had been normal for two or three days, suddenly rose. On Tuesday morning Lord Lister, Sir Thomas Smith, and Sir Frederick Treves had a consultation with Sir Francis Laking and Sir Thomas Barlow and the unanimous decision was that an immediate operation was imperative. At 11 a.m. Treves opened the abscess, which was deep-seated and contained decomposing pus. It was necessary to leave two large drainage tubes in the abscess cavity, but convalescence was uninterrupted, and Edward VII reigned for eight years more.

Treves was a voluminous writer from his earliest days. The first of his many works was published in 1882 and was on *Scrofula and its Gland Diseases*. It was designed to serve as an introduction to the general pathology of scrofula and contained an account of the histology, diagnosis, and treatment of the glandular affections it produces. Much progress had been made in pathological science in methods of microscopic research since the works of Robert Glover and Benjamin Phillips (1846) and Dr. Price (1861) had appeared, and although Continental observers had applied the new methods and knowledge to the investigation of the disease English surgeons had not. Though in the book use was made of the foreign work, the greater part of it consisted of the results of his own clinical investigations in a large number of cases and of a great deal of microscopic research. The book was written before Koch published his discovery of the tubercle bacillus (1883), but the conclusion Treves reached was that scrofula was a milder form or stage of tuberculosis. The volume was illustrated by very fine drawings of the microscopical appearance of diseased glands prepared by himself for his article on scrofula in the then forthcoming edition of Holmes's *System of Surgery*.

The chief aim of *Surgical Applied Anatomy*, published in 1883, was to assist the student in judging the comparative value to him, when applying it practically, of the anatomy he had learnt by attending lectures and dissecting and to show him how to encourage the survival of the fittest of the many hard and unassimilable facts he had then acquired. It should, he maintained, be one of the objects of applied anatomy to invest these facts with the interest derived from an association with the circumstances of daily life; it should make the dry bones live. He fully recognized, teacher of anatomy though he was, that all the details of the subject have not the same practical value and that the memory of many of them may fade without loss to the competency of the practitioner of medicine or surgery. The book was intended mainly for the use of students preparing for their final examination in surgery, but he hoped it would also be of use to practitioners whose memory of their dissecting room had grown a little grey and who wished to recall such anatomical matters as have the most direct bearing upon the details of practice. It is interesting to see, even in this pioneer book on surgical anatomy, the willing recognition by the teacher of the fact that his courses on anatomy taught the student much that could be safely forgotten as soon as examinations were over; in other words, that for ordinary pass examinations students were taught too much. The book met with extraordinary success, so much so that between 1883 and 1906 six editions and fifteen reprints appeared—40,000 copies in all. In the sixth edition he had the collaboration of Professor Arthur Keith.

His book on *Intestinal Obstruction: its Varieties, with their Pathology, Diagnosis, and Treatment* was published in 1884. It was in substance the essay for which the Jacksonian prize was awarded by the Royal College of Surgeons in 1883. For book form it was entirely revised and rewritten in some parts, and such new matter added as was required to bring the work up to date. The importance of this subject at the time of publication of the book may be estimated by the fact that over two thousand individuals were then dying every year in England alone from various forms of obstruction of the bowels, exclusive of hernia. It was also a subject which was but comparatively little understood from the clinical standpoint. For this reason the classification of the different varieties of intestinal obstruction was based on pathological grounds rather than clinical distinction. The work met with a welcome reception because intestinal surgery was then more feared than understood, and it had a very considerable influence on the progress of abdominal operations. It was translated into German, and an American edition was published. A second edition appeared in 1889.

A Manual of Surgery in Treatises by Various Authors was published in 1886. Thirty-five of the leading surgeons of the day co-operated with Treves in writing this work, which aimed at presenting a concise account of the leading facts and principles of modern surgery. The three volumes of which the manual was composed were concerned mainly with the clinical, diagnostic, and therapeutic aspects of surgery, and general principles were dealt with, not technical details.

Treves was one of the first surgeons to devote special attention to diseases of the appendix. He opened the discussion on the surgical treatment of "typhlitis" at the Leeds meeting of the Association in 1889. The term "typhlitis" was then applied to a form of localized peritonitis occurring in the caecal region. The various forms of the disease were fully considered and for the purpose of discussing treatment typhlitis was divided into three classes: (1) The mild form, ending in resolution on the application of simple medical measures and due to faecal accumulation in the caecum. (2) The severe form leading to suppuration and nearly always dependent on some trouble commencing in the appendix. (3) Cases of relapsing typhlitis depending on some recurring trouble in the appendix which falls short of producing suppuration. In this first paper, whilst the term "typhlitis" was used for various conditions described, it was recognized that the appendix was the primary source of the trouble in the great majority of cases, indeed, in practically all that came to operation. In a subsequent paper, written for the first edition of Allbutt's *System of Medicine* and reprinted in separate book form (1897), the term "perityphlitis" was used, the title of the essay being "Perityphlitis and its varieties, their pathology, clinical manifestations, and treatment." By perityphlitis he meant a peritonitis localized in the region of the caecum, and the term was not used to denote the seat of origin of the malady, but to indicate "with sufficient clearness the predominant pathological features of an affection which may arise in more ways than one and which has no precise clinical individuality until the peritoneum in the caecal region has become inflamed." It is interesting to note that Treves looked upon the then new name of the disease "appendicitis" as uncouth. It is wonderful what we can get used to in time. The treatment proposed for conditions equivalent to our modern acute appendicitis is interesting. The mildest cases of typhlitis, due to constipation, were treated with bowel-evacuating medicinal measures. Any suppuration was dealt with on the general surgical principle of first find your pus and then let it out. Treves was not in favour of operating during an acute attack, such as the American surgeons even then proposed to do; he preferred to let the inflammation subside or wait until pus formed. "Deep-seated pus is slow to make its presence evident, and unless there be obvious indications of an abscess it could not be safe to assume that pus had formed before the fifth day of the disease." Hence the tendency of surgery of 1890 to wait five days before operating for appendicitis and to take the risks of perforation and general peritonitis developing. The best results were obtained, in those days, in cases of "relapsing typhlitis" by removing the appendix during the period of quiescence. Treves first advised this operation in 1887 (*Med. Chir. Trans.*, vol. 71, p. 165). Even in his perityphlitis article for Allbutt's *System of Medicine* (1897) he still advised medical measures, including opium and possibly aperients also, in the acute attacks unless it was obvious that pus had formed. When this was definite an operation should be done at once, but it might be laid down as a rough rule "that the use of the knife will seldom be called for before the fifth day. Indeed I would venture to think that surgical interference before the fifth day should not be undertaken except in the presence of emphatic symptoms. Indeed the great majority of operations for perityphlitis are performed after the first week." He recognized the risk of delay, but even then thought that on the whole it did not outweigh its advantages.

A manual of operative surgery (1891) consisted of two large volumes with 422 illustrations. In writing the book he was concerned solely with the practical aspects of treatment by operation, with the technical details of operative surgery, and with such part of the surgeon's work as comes within the limits of a handicraft. He did not deal with the indications for operating, nor did he enter into the "subtle questions, the anxious reasonings, the special doubts, which lie without the operating theatre." Surgical statistics were ventured on with but reverent caution. He was himself responsible for the selection out of the vast and bewildering collection provided by the literature of surgery of practical methods of operating. He selected such measures as appeared to him to be the best, and the majority of the operations were described from personal experience of them in the theatre or dissecting room. The preparation of the patient and the proper after-treatment of the case were dealt with in each section of the book.

The manual met with much success amongst the senior students and the qualified practitioners, but it was too unwieldy for portability and consequently he prepared from it a *Students' Handbook of Surgical Operations* (1892), for the use of students preparing for final examinations and as a handbook to assist them in carrying out operations on the dead body. Only the most essential and most commonly performed operations were described in it. All matters save such as deal with actual technical details of operative surgery were omitted, and he assumed that the reader knew his anatomy. There was no after-treatment, no description of instruments, and no mortality or operation result figures given in the book. Though popular this book was not received with the enthusiasm which met his *Surgical Anatomy*. Both these works were revised with the assistance of Jonathan Hutchinson, junr., and published in second edition in 1903 and 1904 respectively.

With so many interests outside his professional work and so many hobbies to occupy his time, Treves was not one to keep to the humdrum of professional routine life any longer than he could help, and as he made a phenomenally large income even for a popular and successful surgeon he was able to retire from practice in the full tide of life, at the height of success, and with every faculty at its brightest and best. Many men may have the desire to retire at 50 from active work, but few medical men have the means to do so. Treves did practically no private professional work after his operation on the King; he occupied himself by working for the public good, especially in army medical matters. He was a member of the Territorial Forces Advisory Council, chairman of the Executive Committee of the British Red Cross Society, and a member of the London Territorial Force Association, and he was also an honorary colonel in the R.A.M.C. Wessex Division, and an honorary staff surgeon to the R.N. Volunteer Reserve.

He was Lord Rector of the University of Aberdeen (1905-8), receiving its honorary LL.D. degree. He also received honorary degrees from several other universities. He served as an examiner in anatomy or surgery for several years at the Royal College of Surgeons and in Cambridge, Aberdeen, and Durham Universities.

With his love of the sea, his fondness of travel, and his freedom from professional ties, Treves was able to spend a good deal of his leisure time in visiting various and remote portions of the world, journeys which were chronicled in a series of books published over several years. These books were written from the outlook of the unspecialized traveller, of the man who merely seeks somewhere to go. Descriptions of incidents on the journey, impressions of many and varied experiences and scenes, travellers' yarns from the smoke-rooms of liners and hospital clubs, and collations from specialized books in the countries visited are interspersed with shrewd comments and humorous turns of fancy such as might be expected from one who could brighten the dullness of an anatomy book by his thoughtful interest for the anatomical information of a boy who had been recently birched on the gluteal integument.

In the account of his visit to Palestine, Treves did not set out to write a new *Eothen*, nor with his books of wider travel to enter into the word-painting lists with Pierre Loti; he hardly even had the light touch of the surgeon who in his "log" suggested so well the joys of a voyage to the languorous East. He wrote to amuse and occupy himself and to give pleasure to his many friends, and he succeeded well in these objects. The first of these

travellers' tales was an account of "a commonplace tour round the world," which he undertook with Lady Treves and their daughter in 1903-4. The title of it is explained in a short preface: "A paper lantern, round and red, hangs under a cloud of cherry blossom in a Japanese village. There is a very familiar flower symbol painted upon the other side of it. Some children have crossed the green to see what is on the other side of the lantern. A like curiosity has led to the writing of this trivial book."

The account of the crossing of his green and of what he saw is fresh, interesting, and attractive even to those who have crossed it themselves, and who have read innumerable works on similar subjects. A most impressive chapter is his description of a visit to Canton, and the comparison of his olfactory and optical experience there with a horrible nightmare of the kind which haunts the mind in daylight hours is excellent. In *Uganda for a Holiday* (1910), one of the most striking chapters and the most original is the first in the book, describing the nightmare flight across France in the Lyons mail; it was reminiscent of his strikingly vivid impressions of Canton. In Africa itself we come across pleasant reminders of old friends and heroes of our youth, Burton and Speke, and of much later days Colonel Patterson the lion hunter of Tsavo, but the book had no compelling or abiding interest. *The Cradle of the Deep* (1910) was the record of a voyage to the West Indies made a couple of years previously. *The Land that is Desolate* (1912) is an account of a tour in Palestine, and the comments on the Holy Places visited are what might be expected from one who all his life was accustomed to weigh evidence carefully. The very note to the impressions and conclusions of the journey is conveyed in the very last line of the book. "It was not until we were actually ashore at Port Said that we felt safe (it had been a very stormy and uncomfortable passage from Haifa to Port Said)—safe from the possibility of being asked to visit another sacred site." The other side to the question is, however, fully recognized by a passage in the account of the visit to the Church of the Holy Sepulchre. After describing the actual chapel of the sepulchre and commenting on the genuineness of the place, he writes: "As we were leaving the chapel a woman, old, poor, and unhappy-looking, crept through the small door on her knees and after kissing the stone that covered the tomb laid her cheek upon it in the attitude of one who was tired but content. If she was secure in the belief that she had brought her trouble to the very spot where the body of Christ had lain, then the chapel is assuredly more than a place for the curious."

Another work which revealed another of the many facets of his mind was published in 1913 with the title, *The Country of "The Ring and the Book."* Browning students will appreciate at once the nature of the work. The poem, which described a tragedy of two hundred years ago, was to his mind a wondrous one—"as brilliant, as pathetic, as lurid and as dolorous as a winter sunset," "one of the finest, most imaginative, and most human poems of the nineteenth century," "some passages of which are among the most beautiful to be found in the poetry of any country or any age." To the country in which the tragedy was staged Treves made a pilgrimage and described his travels and investigations in wondrous detail, illustrating them with a profusion of photographs, maps, and plans of the houses, streets, country, and towns where the murdered Pompilia lived and the murdering Franceschini and his hirelings did their work and paid the penalty of their crimes. To show the extreme care taken in the preparation of the book, it may be stated that the hundred photographs used in illustration of the text were taken by himself at various seasons of the year, and, for the most part, at or about the actual date in the calendar on which occurred the episode with which the particular scene was associated. Apart from its value to Browning students the work will open the twelve books and twenty thousand lines of the poem to many who to their regret find this poet in his lengthy pieces too difficult for easy reading. The next two books Treves wrote reflected his moves: the one, on the Riviera, was full of his old spontaneous joy in life; the other, on the Lake of Geneva, written after he had settled at Evian, was in a minor key—perhaps the subject was not so vivid. His last work was *The Elephant Man.* He had first told the story in our pages (December 11th, 1886, p. 1188, and April 19th, 1890, p. 916), and in a review of the book (February 24th, 1923, p. 335) some of the original illustrations were reproduced.

After his retirement Treves was granted by King Edward VII the use of Thatched House Lodge, Richmond Park, but in 1920 he went to live abroad. He was made a baronet in 1902 and promoted G.C.V.O. in 1905. When the great war broke out he immediately offered his services. He was made president of the headquarters Medical Board at the War Office, and remained a member of the Army Sanitary Committee. He was one of the founders of the British Red Cross Society at its reconstitution and the first chairman of its Executive Committee. He had a large share in the foundation and organization of the Radium Institute in London and was chairman of its Committee of Management.

He married in 1877, and had two daughters; one of them died at an early age following an operation for appendicitis, the other is the wife of Brigadier-General Sir Charles Delme-Redcliffe.

The remains are to be cremated at Lausanne, and the funeral will take place in England at a date not yet announced.

We are indebted to Sir JOHN BLAND-SUTTON, President of the Royal College of Surgeons of England, for the following tribute:

My friendship with Sir Frederick Treves began in 1883, when he was keenly studying the anatomy of the intestinal tract in man and mammals. I introduced him to the prosectorium of the Zoological Gardens, where he dissected and made water-colour sketches of the disposition and complicated arrangement of the small and large intestines from marsupials to primates. He contemplated producing a monograph on the subject, but the pressure of hospital work—for he rose on the staff with unusual rapidity—prevented this broad study, but the main results of his observations in comparative anatomy led him to write an excellent account of the arrangements, disarrangements, malformations, and mechanical disturbance of the intestines of man.

I have had opportunities of studying his many-sided character, for he was a teacher, an anatomist, and lecturer, as well as a surgeon; also his deep interest in natural history.

Treves's diligence, love of work and writing were remarkable. Early to bed and early to rise make a man healthy, wealthy, and wise. Treves was the embodiment of this ancient and familiar maxim. Much of the writing in the busy hospital period of his life was done in the morning before breakfast. He was the personification of method. When he had an unusual series of operations at the hospital I sometimes accompanied him. He operated with neatness, courage, quickness, and decision based on a sound practical knowledge of human anatomy, and he was an expert dissector. He wore spectacles on account of myopia, but these were laid aside when he performed an operation, and he seemed to peer into the wound. The part he played in forcing surgeons, and later physicians, to recognize the serious and often fatal consequences that arise from inflammation of the vermiform process is well known; it was a happly chance that his extreme familiarity with human bowels peculiarly fitted him to be the exponent of this special form of surgery.

The cosmopolitan crowd of patients at the London Hospital gave him an unusual insight into human conditions and enabled him to manifest his keen interest in men, high and low, rich or poor, maimed and malformed. In many of the tales he told of benefactions bestowed on his poor hospital patients, he was frequently the intercessor, and often the benefactor. I missed Treves very much when he left London. He was an inspiration, always original, and had his own way of looking at things and affairs. He expressed his opinions fearlessly in lectures, demonstrations, consultations, and after-dinner speeches. I think the best example of his peculiar style of writing is the *Tale of a Field Hospital.*

In one of the last letters I received from him he refers to the wild garden connected with Thatched House Lodge in Richmond Park where he lived. He wrote: "I have taken pains to acquire a knowledge of the natural history

Richmond Park," and the letter ends with this paragraph—"As I am never up later than 6 a.m. and as I take a turn in the garden, whether pitch dark or light, always at that hour I have seen a good many strange and beautiful things." My last conversation with him was at Mentone; we discussed the exquisite beauty of an unusually close approach of Venus to the crescent moon, visible that morning at 6 o'clock. Now when I spy the thin crescent I always think of him!

Sir MALCOLM MORRIS, in response to our request, has sent the following brief note:

It is forty years since my acquaintance with the late Sir Frederick Treves began—an acquaintance that soon ripened into intimacy. It was to me that he committed the responsibility of publishing all his medical works. Early in 1883 I called upon him in Gordon Street, Gordon Square, he being at that time demonstrator of anatomy at the London Hospital, to ask him whether he would write a book on surgical applied anatomy for a students' series which I was then editing. He agreed, and asked when it would be wanted. I suggested four months from then, and he there and then fixed the day and hour when the manuscript would be delivered. The promise was literally fulfilled—my first and last experience of the kind in a long editorial career. The circumstance revealed to me that one of his chief characteristics was precision—a quality I afterwards found him to exemplify in everything he did. His industry was amazing. When later he undertook to edit and part-write a system of surgery, having at this time a very large practice as an operating and consulting surgeon, it was his habit to rise at 5 o'clock in the morning to do his literary work for the day before beginning his ordinary duties. A splendid worker, to whom work was not a task but a pleasure, he was equally successful as a holiday-maker. I have vivid recollections of the holidays we spent together abroad, in which he proved himself a buoyant and most exhilarating companion. My most recent association with him has been in connexion with the Radium Institute, of which he was chairman from its foundation, and there can be no doubt that its success was due to his tact and skilful direction.

The many friends of Dr. WILLIAM CORE, late medical superintendent of Stobhill Hospital, Glasgow, will learn with much regret of his death, on November 27th, at the age of 77. He graduated M.B., C.M. at Glasgow University fifty years ago, and in 1876 he took his M.D. He first acted as assistant, in the county of Northumberland, to Dr. Anderson, who died only this year. After a short time Dr. Core returned to Glasgow and was appointed to take charge of Barnhill Hospital, then under the Barony Parish Council, in 1876. He remained there until 1901, when he was appointed medical superintendent of Stobhill Hospital, one of the largest and most up-to-date Poor Law hospitals in the country. This position he held till 1914, when he retired after thirty-eight years spent in Poor Law. During these years he saw and assisted in the revolutionizing of Poor Law hospital work, making these hospitals important training schools for nurses. He was a keen and capable administrator, devoting all his energies to the efficient working of the hospital. The very large number of nurses for whose training he was responsible are holding positions all over the world, many of them important ones. His nature was a kind and generous one, and very unassuming. He always tried to find the good in others, and usually succeeded. He identified himself with the Church of Scotland, in which he always took an active part. The ten years of his retirement were spent in Lenzie, and it is good to think that they were thoroughly enjoyed by him after his long and strenuous medical work.

Dr. HERBERT EDWARD SIEVEKING, who died in London on November 21st, aged 70, had spent most of his professional career abroad. He was born on April 19th, 1853, the third son of Sir Edward Sieveking, M.D., and was educated at Marlborough and at St. Mary's Hospital. He took the M.R.C.S. in 1881, and the L.R.C.P.Lond. in 1889. After holding resident appointments at St. Mary's, he went to Egypt as surgeon to the Victoria Hospital at Cairo, and later took a part in the Government Railway Service of Cape Colony, and was medical officer of the hospital at Fourteen Streams. Afterwards he became medical officer of the British South Africa Company's Police (Rhodes' Pioneers), and when in charge of the base hospital at Fort Tuli had the honour of raising the first flag of the Chartered Company on Hospital Hill, Fort Tuli, on November 12th, 1891, "to welcome Mr. Rhodes on his first visit to the country saved for the Empire by his sole efforts." This flag was presented in 1909 to the Provost and Fellows of Oriel, Rhodes's college at Oxford. Dr. Sieveking received the Order of the Medjidie (4th Class) from the late Khedive of Egypt, Tewfik, for his services in the Cairo Hospital; he also held the Royal Humane Society's bronze medal. He contributed several papers to our columns, including an account of Lady Strangford's Hospital at Cairo, and of the Victoria Hospital there.

Dr. GEORGE WILFRED POLLARD of Birkenhead died from an apoplectic seizure whilst witnessing the recent North *v.* South Rugby football match at Birkenhead. He was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1892 and M.D. in 1897. He was widely known, and respected by all with whom he came in contact. He was late honorary assistant medical officer to the Birkenhead Borough Hospital, senior house-surgeon to the Children's Infirmary, Liverpool, and junior house-surgeon to the Staffordshire Infirmary. Dr. Pollard, who was a member of the Birkenhead Division of the British Medical Association, is survived by his widow and two daughters.

Dr. JOHN HENRY MAINS of Struanville, Clackmannan, died in a nursing home on November 27th, following an operation, aged 66. A native of Stirling, he was educated at the High School there and subsequently studied at the London Hospital Medical College. He took the diploma of L.R.C.P.Lond. in 1887, and for a number of years practised at Portland, and subsequently at Longriggend. He went to Clackmannan to practise about eight years ago and became parish medical officer and certifying factory surgeon. He took great interest in local affairs, was a life member and lecturer of the St. John Ambulance Association, and a member of the Stirling Branch of the British Medical Association. Dr. Mains is survived by his wife, one son, and two daughters. The funeral took place at Stirling cemetery on December 1st.

Dr. CHARLES NELSON ELLIOTT of Oundle, died on November 22nd. He was born in 1848, the son of the late Rev. Charles Elliott, and was educated at Trinity College, Dublin, where he graduated B.A. in 1871 and M.B. (2nd place) and M.Ch. in 1872. After serving as resident to the Richmond and other Dublin hospitals he went to Oundle, where he practised for thirty-seven years. He was medical officer of the Oundle and Fotheringhay district, M.O.H. for the Irthlingborough Urban District, as well as the Oundle and Thrapston Rural District. He was also medical officer to Oundle School, and medical superintendent of the local isolation hospital. He was appointed to the commission of the peace in 1907. His death took place at King's College Hospital, where he had recently undergone an operation. He is survived by his widow, two sons, and three daughters.

Dr. J. AURIOL ARMITAGE, whose death occurred at Hastings on November 26th, formerly resided at Wolverhampton, where he had an extensive practice. He was educated at the Universities of Cambridge and Edinburgh and graduated B.A.Camb. in 1881, M.A. in 1901, and M.B., C.M.Edin. with honours in 1886, taking the M.D.Edin. with commendation for thesis in 1888. He had served the offices of resident physician to the Royal Maternity Hospital, Edinburgh, surgeon to the Wolverhampton Orphan Asylum, and honorary gynaecologist to the Wolverhampton and

Staffordshire General Hospital. He retired to Hastings in 1912, and devoted his energies to the work of the Society for the Propagation of the Gospel. He went on a world missionary tour in 1914, and also visited Peking with Mr. Rockefeller in 1919 for the opening of the Peking Medical College and Hospital.

Medico-Legal.

AN UNQUALIFIED PRACTITIONER.

AT Woolwich Police Court on November 28th, before Mr. Waddy, Clarence Wilfred O'Donoghue, of Heavitree Road, Plumstead, was summoned for falsely using the title of "doctor" on October 13th, 21st, and 22nd, implying that he was registered under the Medical Act; alternatively he was summoned for pretending to be a general practitioner on the same dates. Mr. G. D. Roberts, instructed by Messrs. W. E. Hempson and Sons, solicitors, prosecuted on behalf of the Medical Defence Union. The case arose out of an inquest held by the Woolwich coroner on October 27th on a woman named Healy. The facts were sufficiently reported in the JOURNAL of November 3rd (p. 843).

At the police court Mrs. Walklin, niece of Mrs. Healy, gave evidence that when her son, aged 3 years, was ill, she, believing O'Donoghue to be a fully qualified doctor, called him in, and he examined the child and gave her a bottle of medicine, for which she paid 2s. 6d. Patrick Healy, son of the deceased woman, repeated the evidence he gave at the inquest as to the belief held by his mother and his family that O'Donoghue was a fully qualified doctor, and as to his attendance on his mother up to within an hour of her death.

The shorthand notes of the proceedings at the inquest were put in. These showed that O'Donoghue, in reply to the coroner, had admitted that he had no qualification registrable in this country.

The magistrate said that the Medical Defence Union had quite rightly taken up the case, and it was his duty to convict. The defendant would be fined the maximum penalty of £20 on the first summons and must pay 10 guineas costs, with the alternative of a month's imprisonment.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on December 8th the following medical degrees were conferred:

M.D.—E. W. Todd.
M.B., B.CH.—L. S. Fry, C. Sturton, G. E. Burton, C. V. Patrick
B.CH.—J. M. Bickerton.

UNIVERSITY OF LONDON.

IT has been decided to institute a readership in pharmacology at the London School of Medicine for Women.

Dr. Lydia Henry has, on the nomination of the Board of Principal Teachers of King's College for Women, been appointed a member of the King's College Delegacy for the period ending February 24th, 1924, in succession to Dr. J. Lane-Claypon, resigned.

Professor A. E. Boycott, F.R.S., has been reappointed Director of the Graham Medical Research Laboratory for a period of one year as from January 1st, 1924.

Internal and external students who under the old regulations have followed an approved course which has included pharmacy and materia medica for the second examination for medical degrees, Part II, will not in future be required to follow courses in the same subject in preparation for the third examination for medical degrees.

Sir Wilmot Herringham has been elected chairman of the Gresham Legacy Committee for 1923-24.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

THE following have after examination been admitted as Fellows: Joseph Dunbar, James Hendry, John Marshall, Thomas D. Miller, John R. B. Robb, Sidney H. Waddy.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

AT the monthly business meeting of the President and Fellows, held on December 7th, the following candidates, who had been successful at the Conjoint and Final Examination in November, were duly admitted to the licences in medicine and midwifery of the College:

F. J. N. Carney, A. E. Clements, M. H. Dobbyn, F. D. Fitzpatrick, W. G. C. Fitzpatrick, H. I. Hawkes, Rosaleen H. Hoskin, Kathleen O. M. Kennedy, Catherine M. King, G. A. Little, J. J. Marlborough, Sarah Matson, F. M'Connell, E. A. M'Manus, J. J. O'Donnel, J. O'Donnell, W. O'Neill, V. J. O'Toole, H. C. Patterson, G. F. Plant, P. B. Ryan, J. Unsworth, S. P. Wallace.

Medical News.

THE Purvis Oration before the West Kent Medico-Chirurgical Society will be delivered to-day (Friday, December 14th), at 8.45 p.m., at the Miller General Hospital, Greenwich. The orator is Sir Thomas Horder; his subject is "Carcinomatosis."

A LECTURE on a tuberculosis settlement, illustrated by the cinematograph, is being given by Sir James K. Fowler at the Middlesex Hospital Medical School this day (Friday, December 14th) at 3 p.m.

THE Kensington Division of the British Medical Association has arranged a ball in aid of the Royal Medical Benevolent Fund. The ball will be held at the Kensington Town Hall on Tuesday, February 5th, 1924, from 9 to 2 o'clock, under the patronage of H.R.H. Princess Louise, Duchess of Argyll. Tickets, price 1 guinea each, or six for 5 guineas, can be obtained from the Honorary Secretary, Dr. Howard Stratford, 20, Upper Phillimore Place, Kensington.

THE house and library of the Royal Society of Medicine will be closed from Monday, December 24th, to Thursday, December 27th, both days inclusive.

THE Liverpool Psychological Society has been inaugurated under the presidency of Professor Alexander Mair, M.A., of the University of Liverpool, supported by Dr. Betts Taplin as vice-president and an influential committee. The society intends to pursue the systematic investigation of the recent developments of the science. Further information can be obtained from the Secretary of the Society, The University, Liverpool.

DR. W. L. P. BEVAN, formerly medical officer of health for Alton, has been presented by the townspeople with a fur coat, leather travelling bag, and an illuminated address on the occasion of his retirement from practice after thirty-five years' residence in the town.

THE next meeting of the Central Rhineland Surgical Association will be held at Frankfort on January 12th, 1924, when the following subjects will be discussed: (1) Diagnosis of diseases of the female breast. (2) Results of operative treatment for spinal cord disease in spondylitis and fractures of the vertebrae.

THE Nobel prizes for 1922 and 1923 were formally presented in Stockholm on December 10th by the King of Sweden. Among those who attended the ceremony was Dr. A. V. Hill, Jodrell Professor of Physiology in University College, London.

IT is announced by the Paris correspondent of the *Morning Post* that an international committee has been founded to establish an Institut Coué d'Education physique (Méthode par l'imagination). The committee includes several members of the medical profession in France.

PROFESSOR KARL SUDHOFF, the well known medical historian of Leipzig, has recently celebrated his 70th birthday.

DR. GEORGES GUILLAIN has been nominated professor of nervous diseases in the Paris Faculty of Medicine, in succession to Professor Pierre Marie, and Dr. Sicard has succeeded the late Professor Rénon in the chair of medical pathology.

MESSRS. J. AND A. CHURCHILL announce for early publication the fifth edition of Dr. Henry Jellett's *Short Practice of Gynaecology*, with 10 coloured plates and 318 illustrations in the text.

THE Secretary of the Nurses' Co-operation, 22, Langham Street, W.1, informs us that the year's work of the Nurses' Needlework Guild was displayed at the Howard de Walden Nurses' Club last week. The garments are distributed to various hospitals.

THE first number of a new quarterly Polish publication, which will publish articles on medicine, has been received, and is to be welcomed as a valuable addition to medical literature. Under the editorship of Professor A. Gluzinski, of the University of Warsaw, and with the official approval of the Minister for Art and Public Education, it will contain articles by members of the hospital staffs, and include accounts of the progress of medical research. An abstract in French is given of each article. The present number includes papers on the diagnosis of pulmonary syphilis, by Professor Gluzinski; on methods of determining hepatic insufficiency, by Dr. W. Filinski and Dr. W. Proszowski; on neutral fats in the blood, by Dr. Z. Gorecki; on cholesterin in the blood, by Professor W. Orlowski of Cracow University; on the sedimentation of red blood corpuscles, by Dr. Eleonora Reicher; on von Pirquet's reaction, by Dr. L. Sobieszczanski and Dr. Z. Michalski; and on the influence of pilocarpine upon the amount of sugar in the blood and urine, by Dr. J. Wegierko.

THE sixteenth annual report of the British Guiana Society for the Prevention and Treatment of Tuberculosis contains records of the work of three dispensaries in Demerara and one in New Amsterdam. Six lady health visitors are associated with these; 8,844 domiciliary visits were made in the course of the year, and milk, disinfectants, and respirators were distributed. The committee urges that all this special tuberculosis work ought to be made part of the medical service of the colony and be under a whole-time tuberculosis officer. So far it has not been possible to undertake the routine inspection of school children. There is in the report a note by Dr. Massiah on treatment by a preparation of garlic in honey, which he considers a successful palliative but by no means curative. Treatment was unsatisfactory to a large extent because patients ceased to attend when they began to improve, and so the maximum benefit was not obtained. It has been found very difficult to isolate advanced cases owing partly to lack of hospital accommodation and the absence of any scheme of compulsory segregation.

MR. PHILIP KRUSEMAN, publisher (The Hague, Noordeinde 91), has again issued a medical art calendar of the same general character as those that have appeared in previous years—that is to say, it contains reproductions of a number of paintings and engravings representing scenes of more or less medical interest, ranging from the travelling charlatans and dentists to operations and lectures on anatomy. This issue is dedicated to the Netherlands Association for the Advancement of Medicine, which was founded seventy-five years ago. The price is 6s., post free.

IN the notice of the *Medical Directory* for 1924, published last week, it was said that the list of practitioners beyond the seas "does not include those who hold degrees from Dominion Universities but have not taken diplomas or degrees in the home countries." The statement ought to have been "but have not registered in the home countries." So far as we are aware no directory of Dominion practitioners who have not registered on the British *Medical Register* is available.

IN a pamphlet consisting of articles reprinted from the *Hamilton Advertiser*, Dr. Maxwell Adams—the fourth of the name—continues his story (mentioned in the BRITISH MEDICAL JOURNAL of April 23rd, 1923) of the medical family to which he belongs. The matter now published is taken mostly from an autobiography left by Dr. Maxwell Adams *primus*; it tells how this "dynasty of doctors" began, how he, through many hardships, and whilst a married man with wife and family to maintain, succeeded in completing his medical curriculum in Edinburgh in the early years of last century, and entered on practice there.

THE jubilee of the Boston University medical school has recently been celebrated. In one sense the school is older than this, since seventy-five years ago Dr. Samuel Gregory opened the New England Female Medical College in that city, which, on the death of its founder, was taken over by the university and opened as its medical school.

THE Tropical Diseases Library, now arranged in the building of the London School of Tropical Medicine (23, Endsleigh Gardens, N.W.1), was formed by the amalgamation of the libraries of the School and of the Tropical Diseases Bureau. The annual report of the librarian, Mr. Cecil C. Barnard, B.A., shows that the joint library continues to increase and that great efforts are made to keep it up to date. Recent additions include the most important new publications on tropical medicine and a large collection of older German volumes particularly rich in books on cholera. Space had been found in the reading room for an increased number of monographs, so that the number of volumes immediately accessible to readers has increased from 250 to 715. A list of a few numbers of periodicals and reports missing from sets can be obtained from the librarian, who will also be prepared to discuss the disposal of duplicate numbers of certain journals with librarians of other institutions. Volumes can be borrowed, and the library also has a subscription with Lewis's Lending Library. A card catalogue, containing authors and subjects in one alphabetical sequence, is in course of preparation.

AN intensive course at the North-East London Post-Graduate College, Prince of Wales's General Hospital, will begin on February 4th, 1924, and will last for fourteen days. It will include lectures and demonstrations of clinical methods and cases, and work in the general wards and special departments of the hospital. Those proposing to take the course should notify the Dean not later than January 31st.

PROFESSOR R. KRAUS, Director of the Serum Institute at Sao Paulo, has resigned his appointment and returned to Vienna.

THE next Congress of the Royal Sanitary Institute will be held at Liverpool from July 14th to 19th, 1924, by invitation of the Lord Mayor and City Council.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.

ORIGINAL ARTICLES and **LETTERS** *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

IN order to avoid delay, it is particularly requested that *ALL* letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediscera Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

WE are asked what can be done to prevent players on a certain football ground in the tropics from suffering septic infection from slight scratches that they may receive. The ground is liable to contamination by human and cattle excreta, but the former at least can be prevented or checked. A football ground ought, of course, to be well scavenged, but even so, we conceive that any attempt to disinfect the soil must fail. In this country we believe that it is now customary to treat scratches or small wounds received at football with tincture of iodine—that is to say, to treat the patient and not the ground.

INCOME TAX.

Legal Expenses.

"B. S. F." inquires whether the legal charges in connexion with a partnership deed, necessitated by the introduction of a new partner, are an allowable expense for income tax purposes.

*** Such expenses are not incurred in the carrying on of the profession, but in connexion with the creation of the firm; they are analogous to the formation expenses of a company, are of a capital nature, and not allowable.

Succession to a Practice.

"L." bought a practice in January, 1922, and paid income tax on the basis of his predecessor's assessment for the period to April, 1922. He was asked to send in an estimate of profits for the year to April, 1923; did so, and paid tax thereon. For 1923-24, however, he has been assessed on the basis of the previous three years' average profits of the practice.

*** The last-mentioned basis is correct where there has been a definite succession in a practice. The request for 1922-23 and resulting assessment were apparently based on a misapprehension of the facts by the authorities.

LETTERS, NOTES, ETC.

CIRCULATION AND ASSIMILATION IN PLANTS.

SIR JAGADIS CHUNDER BOSE, F.R.S., of Calcutta, addressed the Royal Society of Medicine on December 6th on some further work he has done on circulation and assimilation in plants. Strasburger's statement that poisoning did not affect the ascent of sap, and that therefore the movement of sap could not be due to the physiological action of living cells, had been widely accepted, but his own observations with a special apparatus showed that complete arrest of sap did take place under the action of poison; he concluded, therefore, that the movement of sap in living plants was essentially due to cellular activity. An active tissue exchange took place throughout the length of the tree, and the propulsion of sap was due to cellular pulsations in regular sequence. Striking results were produced on these pulsations by the action of anaesthetics; a small dose—of ether, for example—acted as a stimulant and increased the rate of ascent of sap. This cellular activity underwent periodic variation in response to environmental changes during twenty-four hours. The pulsatory movement of a plant cell was ultra-microscopic, but by experiments with an electric probe in circuit with a recording galvanometer, the probe being gradually introduced

across the plant so that its tip came into contact with successive layers of cells, he was led to conclude that intense and ceaseless pulsations were taking place behind the placid exterior. It was through these incessant internal activities that the tree was enabled to raise large quantities of water to a height which, in the giant eucalyptus, reached 450 feet. The energy for doing this work was obtained by the breakdown of complex chemical substances in internal combustion or respiration, and he had devised what he called a photosynthetic recorder to register certain of these changes. This instrument, he said, was sensitive enough to measure a photosynthetic deposit of carbohydrate as minute as one-millionth of a gram. It was a device whereby the evolution of oxygen—a very sensitive indicator of photosynthesis—was recorded electrically by successive dots on a revolving drum. It was found that minute traces of various chemical agents would induce an extraordinary enhancement of assimilation in plants. Extract of thyroid gland, in the dilution of one part in a billion (that is, French measure, equal to 1,000 million), produced a maximum increase of activity of about 70 per cent. The effect of doses of iodine was more or less similar. The demonstration of the effect of minute traces of chemicals on assimilation of plants was of special interest since it offered some analogy to the effects of ultrameasurable quantities of vitamins on general assimilation and of hormones on physiological reaction. The plant was a multicellular organ, and hence the necessity arose for intercommunication and interaction between more or less distant organs. This was accomplished in two different ways, the first being exemplified by hydraulic convection of liquids carrying chemical substances in solution, and the second by the conduction of excitatory change along certain tissues in the plant which functioned as nerves. The plant and the animal were similar in their contractile movement under stimulation, their reaction to particular drugs, their cell-to-cell propagation of pulsatory movement, their circulation of fluid by pumping action, their nervous mechanism for the transmission of excitation, and their reflex movements at the distant effector. He concluded that the simpler type of plant organism offered scope for investigation the pursuit of which would no doubt lead to the solution of many perplexing problems of animal life.

Spirit in Hair Washes.

SEVERAL correspondents have written to us with regard to the note on this subject published in the JOURNAL of December 1st (p. 1072), and we find that the information in the *Extra Pharmacopoeia* was incomplete. The Revenue Act, 1906, clause 13, laid it down that a retailer must not use methylated spirit in any art or manufacture unless he has been authorized to do so; but subsequently the Board of Customs and Excise issued an Order (1913 stating that "mineralized methylated spirit may be used by registered chemists and druggists in the preparation of lotions for external use, when prescribed by duly certified medical practitioners." Chemists, however, are liable to a penalty if the methylated spirit is used in any preparation capable of being consumed as a beverage or used internally as a medicine.

Ante-partum Haemorrhage and Eclampsia.

DR. J. LEWIS THOMAS (Newport, Mon.) writes: May I recall briefly a somewhat exciting experience of a winter's day in 1910. A butcher's wife asked me to see her as I was going home to lunch. She complained of a "dreadful headache" with much giddiness, and said that she was passing very little urine. As she was more than eight months pregnant the situation was not pleasant. The urine was practically solid on boiling. She was ordered to bed and the usual treatment advised; she was specially requested to send for me at the slightest signs of labour or convulsions. About 9 p.m. I was sent for, and on arrival found that she had got on the bed in ordinary attire. She was unconscious and actively and almost continuously convulsed. I applied a chloroform mask, well saturated, over her face. While a nurse was being secured I examined for signs of labour and was delighted to find placenta praevia. The os was fairly patulous and soft; and as the bleeding was very free I performed podalic version without removing the hand. The convulsions ceased after delivery and consciousness soon returned. The baby seemed recently dead. The same woman had given me great anxiety four years previously owing to post-partum haemorrhage.

Accidental Hydrotherapy.

DR. J. N. LORING (London) writes: The following incident may appeal to those interested in hydrotherapy. Last year I was acting as surgeon to a ship on the Australian coast. We were lying at anchor in the Spencer Gulf, fifteen miles from Port Pirie, when one of the men was taken ill. His temperature rose to 103°, and there was violent purging accompanied by cramp-like abdominal pains. He was restless and slightly delirious during the night, and it was decided to remove him to hospital before proceeding on our voyage. Accordingly a small open motor boat arrived, and the patient, whose temperature was now 103.5°, was laid on the bottom of the boat. The run to Port Pirie occupied about an hour and a half. The patient vomited three or four times and passed numerous motions, but his pulse remained good throughout the journey. A tablespoonful of brandy was given every twenty minutes. During the passage the patient was drenched repeatedly with salt spray. The launch shipped a few gallons of water, so that the blankets which covered him became nearly saturated. On entering hospital ashore his temperature was found to be 101°, and he fell into a quiet sleep. He woke about three hours later and said he felt much better. His temperature had risen to only 101.5° and was never again higher than this. Henceforward, I am informed, his progress was uninterrupted. This somewhat unconventional method of administering hydrotherapy seems to have lowered the temperature effectively without producing any baneful results.

Ethyl Chloride-Chloroform Sequence.

DR. THEODORE M. KENDALL (Newport, Isle of Wight) writes: I have been much interested in a controversy which has been occupying the pages of the JOURNAL. I notice that many well known men who ought to be able to speak with authority have been condemning the use of chloroform as a general anaesthetic, and have been pointing out the dangers of such use. I have been a busy man for many years and have practised in country places where other help could not be obtained. I have never found chloroform fail me, nor have I—very fortunately, of course—ever experienced any of the dangers alleged to attend its use. I have found chloroform a safe and valuable assistant in cases of childbirth and for operations in young children. I have frequently administered it, in the half-reclined position of the dentist's chair, and have never been confronted with any mishap. I cannot understand why it is considered now so dangerous or why there is a tendency to push its use aside in favour of other anaesthetics which to my mind do not produce such a comfortable and safe anaesthesia. Maybe I have been fortunate in my patients, but still I have been at times fifty miles from any town and have had to administer the anaesthetic and perform the operation quite unaided in order to save life.

The Cause of Hernia.

DR. MARTIN J. CHEVERS (Withington, Manchester) sends us a communication commenting on certain statements in the brief note (November 10th, p. 888) giving a summary of Sir Arthur Keith's Banks Memorial Lecture on the incidence and cause of hernia. Dr. Chevers states that after over a quarter of a century's observation in general practice he has come to the firm conclusion that hernia, whether in infancy, adolescence, or old age, is due to a weakness of the guarding tissues, whether muscular or connective, which weakness is brought about solely by rheumatism, oftener than not of the incipient form; he attributes the smaller incidence in the female to the exceptional strength of this neighbourhood in their case; but as a set-off they have vaginal prolapses with, in his opinion, a similar etiology.

Septic Pneumonia with Haemorrhagic Complications in an Infant.

DR. WALTER FISHER (Kalene Hill, N. Rhodesia) sends the following note which he recently received from a missionary living many miles from medical help: "For the first seven days (after birth) all went well with mother and child (the child 7 lb. in weight and apparently healthy). On the seventh night the child had poor appetite, and next morning some signs of colic, very small curd being noticeable in stools . . . and a few hours later the whole leg became bluish and white in patches. . . . The breathing became heavy, like that of bronchopneumonia. . . . The temperature rose to 105°–107° F. . . . his stools turned tarry black, and later the white and blue patches spread. On the tenth day the temperature came down, but the child took no nourishment and died in the evening, a large amount of brown mucus coming out of nose and mouth immediately after death."

*** In attempting to reach a diagnosis from the data supplied it may be assumed that all the striking morbid conditions have been reported—for example, that there was little or no vomiting, and that the changes in the leg were chiefly discoloration of the skin without gross swelling. The height of the fever, together with the laboured breathing, make it almost certain that acute pneumonia occurred on the seventh day, and killed the child three days later. But the other clinical facts, the bleeding from the bowels and the condition of the leg, suggest that the pneumonia was not the more common pneumococcal type, but septic and probably streptococcal. The most likely source of septic infection at this time is the umbilical cord; and even if there were no apparent inflammation at the navel it is quite possible that there was a hidden focus in the cord tract, from which a haemolytic streptococcus set up septicaemia, septic pneumonia, with haemorrhages from the intestinal mucosa. The condition of the leg seems more difficult to explain. But cases of umbilical sepsis and septicaemia have been reported where a spreading cellulitis has reached the groin along the pre-peritoneal tissues, and has caused there abscess or septic thrombosis. In the present case it would not be possible to do more than guess at the condition of the leg, in the absence of a fuller report, and to suggest that it was some circulatory disturbance produced by septic mischief in the groin.

Vacancies.

NOTIFICATIONS of offices vacant in universities, medical colleges and of vacant resident and other appointments at hospitals will be found at pages 31, 32, 33, and 35 of our advertisement columns, and advertisements as to partnerships, assistantships and locumtenencies at pages 34 and 35.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 276.